BRISTOL BAY-ALASKA PENINSULA

AND

KODIAK-ALEUTIANS

2002 Fisheries Resource Monitoring Plan

Review Draft

Federal Subsistence Management Program

TABLE OF CONTENTS

INTRODUCTION

Background

On October 1, 1999, the Secretaries of the Interior and Agriculture expanded federal subsistence fisheries management in Alaska under Title VIII of ANILCA. To meet this management responsibility, the Federal Subsistence Board established the Fishery Resource Monitoring Program to gather information on fish stock status and trends, subsistence harvest patterns, and traditional ecological knowledge. Improving the range of available information is crucial to effective fisheries management—both to protect fishery resources and to ensure the subsistence priority.

The Fishery Resource Monitoring Program funds studies to gather, analyze, and report information needed to manage and conserve subsistence fishery resources, address fisheries issues and priorities identified by the Regional Advisory Councils, minimize fishery conflicts, and address regulatory actions before the Board. The Board has adopted a unified approach where federal agencies work together with state, tribal and local organizations. The Monitoring Program is multi-disciplinary, blending together the biological and social sciences with traditional ecological knowledge to manage and conserve fishery resources and ensure priority is given to subsistence users on Federal Conservation units in Alaska.

The five Federal agencies work with Alaska Department of Fish and Game, Regional Councils, Alaska Native tribes, and other organizations to implement the Monitoring Program. The Federal Subsistence Board continues to rely on the special role of the Regional Councils to document fishery issues and data needs, and to provide recommendations on studies to implement the Monitoring Program. The purpose of this booklet is to document management issues and information needs, and to present the 2002 draft Fishery Resource Monitoring Plan.

Study Selection Process

To develop an effective and scientifically sound monitoring program, local input on management issues and information needs is vital to ensure that the highest priority subsistence needs are addressed. During the winter 2001 and fall 2000 Regional Advisory Council meetings, the Councils were requested to provide this input as an important first step in the development of the 2002 Fishery Resource Monitoring Plan. Subsistence users, the public, tribes, ADF&G, and federal agencies worked with the Regional Advisory Councils to identify issues and information needs. This information is summarized in the overview for each region.

To ensure studies are scientifically sound and address subsistence priorities, the Board has developed a process where interested parties submit study proposals that address the management issues and information needs identified by the Regional Councils. Proposals are evaluated by Fisheries Information Services Division staff and the Technical Review Committee using four ranking factors: strategic priorities, technical-scientific merit, past performance-administrative expertise, and partnership-capacity building, as detailed on the next page.

Ranking Factors for Federal Subsistence Fisheries Studies

Strategic Priorities

Ideal studies will be responsive to the issues and information needs identified within the Regional Advisory Councils. Studies should address the criteria listed below and must fully meet the first criteria to be eligible for federal subsistence funding.

1. **Federal Jurisdiction** – Issue or information needs addressed in studies must have a direct association to a subsistence fishery within a federal conservation unit.

2. **Conservation Mandate** – Risk to the conservation of species and populations that support subsistence fisheries and risk to conservation unit purposes.

3. **Allocation Priority** – Risk of failure to provide a priority to subsistence uses and risk that subsistence harvest needs will not be met.

4. **Data Gaps** – Amount of information available to support subsistence management (higher priority given where a lack of information exists).

5. **Role of Resource** – Importance of a species to a subsistence harvest (e.g., number of villages affected, pounds of fish harvested, miles of river) and qualitative significance (e.g., cultural value, unique seasonal role).

6. **Local Concern** – Level of user concerns over subsistence harvests (e.g., allocation – upstream vs. downstream, recreational use concerns, changes in size of fish).

Technical-Scientific Merit

Technical quality of the study design must meet accepted standards for information collection, compilation, analysis, and reporting. Excellent studies will have clear study objectives, appropriate sampling design, correct statistical analysis procedures, and specified progress and final reports.

Past Performance-Administrative Expertise

Investigators and their organizations should have demonstrated technical and administrative expertise to complete the study or have co-investigators or appropriate partnerships with other organizations to meet all requirements of the study. Studies must be non-duplicative with other studies. Principal and co-investigators should possess the expertise required to complete the study and have had successful experience with similar studies.

PARTNERSHIP-CAPACITY BUILDING

> Studies must include appropriate partners and contribute to the capacities of agencies, local communities, and residents to participate in fishery resource management. Studies must have completed appropriate consultation about their study with local villages and communities in the area where the study is to be conducted (letters of support from local organizations add to the strength of a proposal). Investigators and their organizations should be able to demonstrate the ability to maintain effective local relationships and a commitment to capacity building.

For studies that best meet the four ranking factors and address Regional Council priorities, investigation plans are prepared to more fully evaluate the studies against the ranking factors and Council issues. The investigation plans are reviewed by the Technical Review Committee, and the highest quality proposals that address urgent management concerns are then put together into a draft monitoring plan. Because local involvement and capacity building are critical components of the Monitoring Program, the draft plan is presented to the Regional Councils for their review. Public input is also gathered, and the draft plan is presented to the Federal Subsistence Board, along with Regional Council and public comments. For the 2002 Monitoring Plan, the Board will make decisions on the final plan in December, 2001. Most studies approved by the Board will begin during summer, 2002.

2002 Fisheries Resource Monitoring Plan

In 2002, Congress continued to fund implementation of the Fisheries Resource Monitoring Program. During 2002, the U.S. Fish and Wildlife Service will provide $5.25 million and the U.S. Forest Service will provide $2.0 million, for a total of $7.25 million for the continuation of existing studies and for new study starts. Money for new study starts, the 2002 Fishery Resource Monitoring Plan, was first allocated by data type and geographic region to establish target budget levels for 2002 study funding:

- To maintain the multi-disciplinary approach of the Fisheries Resource Monitoring Program, two-thirds of the funding will be targeted at stock status and trends studies, and one-third at harvest monitoring and traditional ecological knowledge.

- The program also wishes to achieve an appropriate balance between the six geographic regions: Arctic/Kotzebue/Norton Sound, Yukon River, Kuskokwim River, Bristol Bay/ Alaska Peninsula/Kodiak, Cook Inlet/Gulf of Alaska, and Southeast Alaska. It is recognized that, based on the distribution of Federal lands and waters, the management issues confronting the Board are greater in some regions than others. The Yukon and Kuskokwim rivers, for example, have large Federal land areas, with intensive subsistence fisheries. A portion of the funding is also allocated to inter-regional studies to address statewide concerns.

Other considerations and policy decisions entered into recommendations for 2002 study funding:

- The Technical Review Committee recommended studies that attempt to balance across species (salmon, resident species), study type (e.g., fish weirs, test fisheries, sonar,

genetics, escapement, biology, harvest assessment, subsistence harvest mapping), and geographically within a region (up river, down river).

- At the direction of the Board, a minimum of 60% of the study funding is dedicated to non-federal sources.

- The Board provided guidance on types of activities that they did not find appropriate for funding under the Fishery Resource Monitoring Program. Activities not eligible for funding include: a) habitat protection, restoration, and enhancement; b) hatchery propagation, restoration, enhancement, and supplementation; and c) contaminant assessment, evaluation, and monitoring. These activities on Conservation System Units would most appropriately be addressed by the land management agencies.

- In 2002, the Partners for Fisheries Monitoring Program will be implemented at a proposed budget of $1.050 million. The Office of Subsistence Management will develop cooperative agreements to fill up to ten Partners for Fisheries Monitoring positions within tribal, rural, or state organizations, including both fishery biologists and social scientists. These positions will help develop and implement Resource Monitoring Program studies, communicate the results of fisheries studies to various audiences (Federal Subsistence Board, Regional Advisory Councils, Office of Subsistence Management, regional organizations), and help develop the capacity of rural residents to effectively participate in the fishery management process.

Many studies approved by the Board in 2000 and 2001 were designed to continue on for several years. In 2002, approximately $5 million is required to fund the continuation of 2000 and 2001 studies. When making study recommendations in 2001, the Committee recommended to the Board that approximately one-third of the Monitoring Program funds be made available to initiate new studies in 2002 and 2003. Using carryover balances from the Program's first year of implementation, the U.S. Fish and Wildlife Service and U.S. Forest Service are capable of providing $2.1 million for new studies in 2002 **(Figure 1)**.

In 2003, we currently estimate that $1.2 million will be available for new studies. Unlike the 2002 process, investigation plans that are not selected for funding this year will not automatically become eligible for funding consideration next fiscal year. By insisting that investigators submit new proposals during the 2003 call for proposals, we will encourage submissions that: are current with Issues and Information Needs; addressed reviewer comments; and have updated their budgets. Investigators will need to submit new proposals requests for consideration of any new projects in 2003.

For the 2002 Fisheries Resource Monitoring Program, 120 new study proposals were submitted in February 2001. Of these, 48 were advanced for preparation of Investigation Plans. In addition, 9 studies submitted in 2001 that were not funded were advanced for reconsideration. The map below **(Map 1)** displays the geographic distribution of 57 studies advanced in 2002.

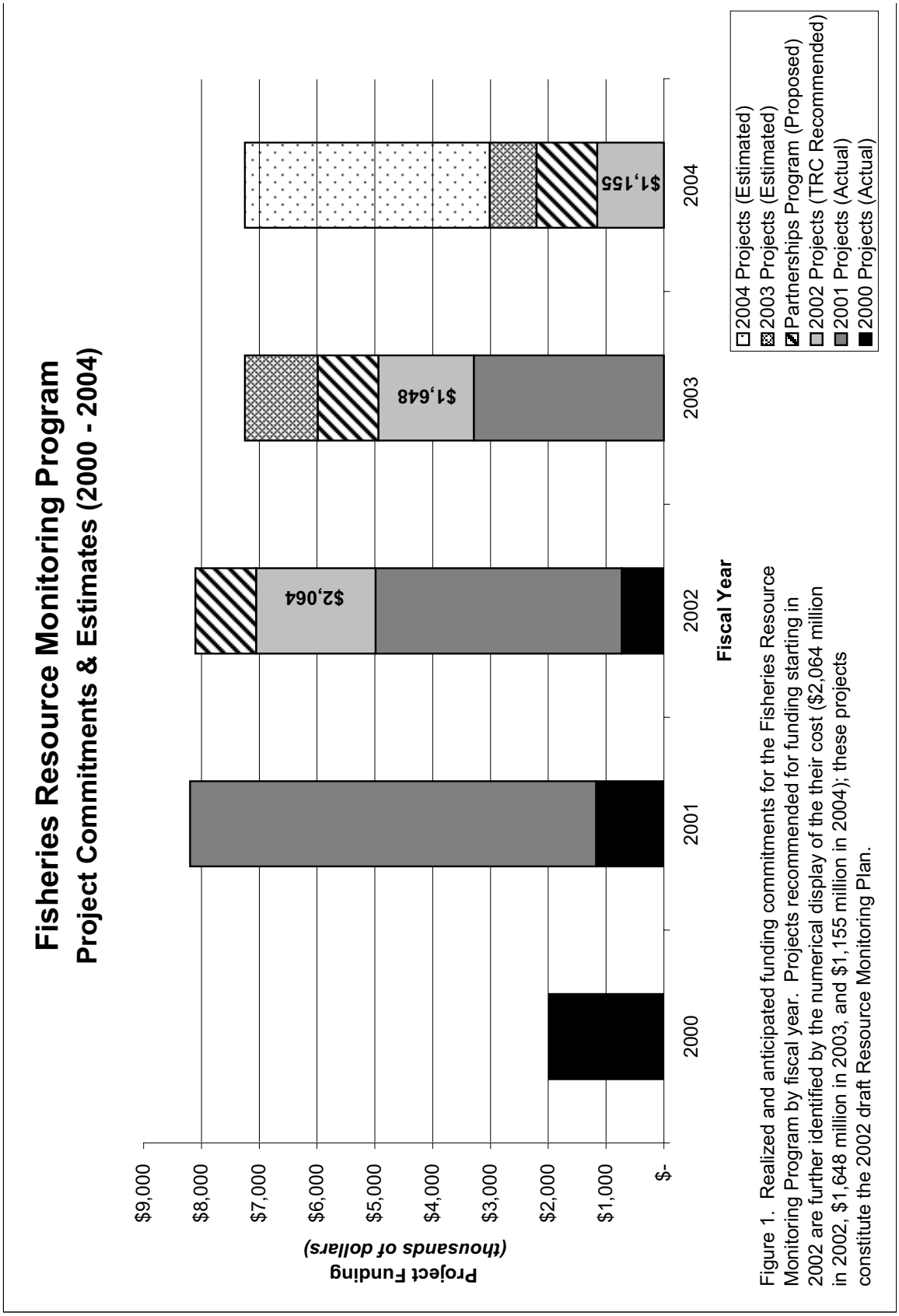


Figure 1. Realized and anticipated funding commitments for the Fisheries Resource Monitoring Program by fiscal year. Projects recommended for funding starting in 2002 are further identified by the numerical display of the their cost ($2,064 million in 2002, $1,648 million in 2003, and $1,155 million in 2004); these projects constitute the 2002 draft Resource Monitoring Plan.

Map 1. Distribution of projects for funding consideration under the 2002 Fisheries Resource Monitoring Program

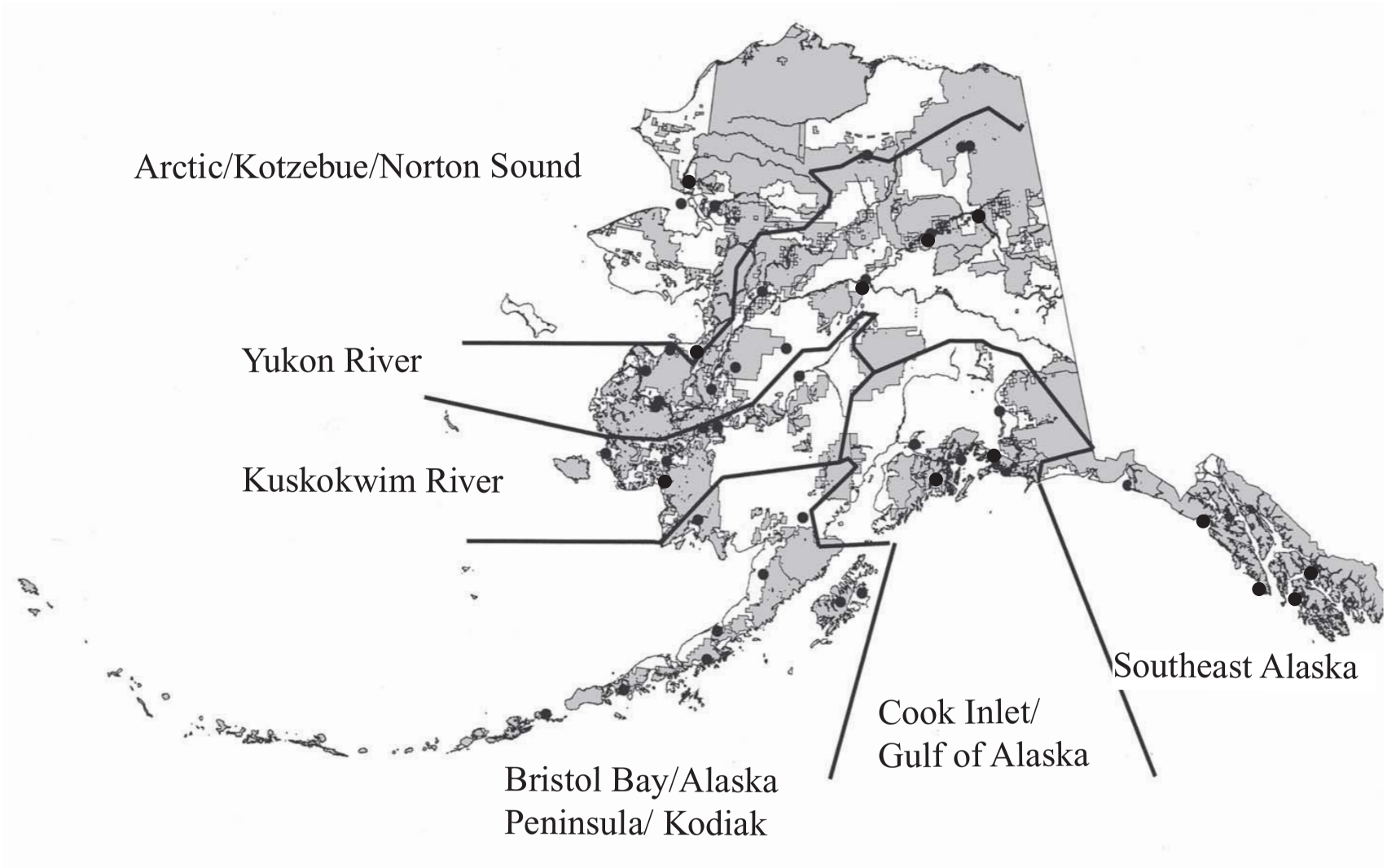


Table 1. Number of studies recommended for funding in fiscal 2002 by Technical Review Committee. Abbreviations for study information types are as follows: SST=Stock Status adn Trends, HM=Harvest Monitoring, TEK=Traditional Ecological Knowledge

	Unfunded 2001 Studies			New 2002 Studies			**All Studies**			**Recommended Studies**		
Geographic Region	SST	HM-TEK	Total	SST	HM-TEK	Total	**SST**	**HM-TEK**	**Total**	**SST**	**HM-TEK**	**Total**
Arctic, Kotzebue, Norton Sound	0	0	0	3	4	7	**3**	**4**	**7**	**1**	**3**	**4**
Yukon River	2	0	2	4	5	9	**6**	**5**	**11**	**3**	**3**	**6**
Kuskokwim River	0	0	0	3	4	7	**3**	**4**	**7**	**2**	**3**	**5**
Bristol Bay, Kodiak	4	0	4	2	3	5	**6**	**3**	**9**	**3**	**1**	**4**
Cook Inlet, Gulf of Alaska	1	1	2	3	3	6	**4**	**4**	**8**	**1**	**3**	**4**
Southeast	1	0	1	5	4	9	**6**	**4**	**10**	**2**	**3**	**5**
Inter Regional	0	0	0	3	2	5	**3**	**2**	**5**	**2**	**1**	**3**
Total	8	1	9	23	25	48	**31**	**26**	**57**	**14**	**17**	**31**

Table 2. Cost of proposals recommended for funding in 2002 by the Technical Review Committee. Funding shown in thousands of dollars

	SST Studies		HM-TEK Studies		**All Studies**		
Geographic Region	Target	Recommended	Target	Recommended	**Target**	**Recommended**	Difference
Arctic, Kotzebue, Norton Sound	$161.0	$20.0	$81.0	$182.0	**$242.0**	**$202.0**	$40.0
Yukon River	$275.0	$251.0	$138.0	$132.0	**$413.0**	**$383.0**	$30.0
Kuskokwim River	$275.0	$283.0	$138.0	$111.0	**$413.0**	**$394.0**	$19.0
Bristol Bay, Kodiak	$142.0	$134.0	$71.0	$91.0	**$213.0**	**$225.0**	-$12.0
Cook Inlet, Gulf of Alaska	$194.0	$229.0	$97.0	$97.0	**$291.0**	**$326.0**	-$35.0
Southeast	$282.0	$287.0	$141.0	$141.0	**$423.0**	**$428.0**	-$5.0
Inter Regional	$70.0	$78.0	$35.0	$28.0	**$105.0**	**$106.0**	-$1.0
Total	$1,399.0	$1,282.0	$701.0	$782.0	**$2,100.0**	**$2,064.0**	$36.0
Percent of Grand Total	67%	62%	33%	38%			

For the $2.1 million available for new studies, the Technical Review Committee recommended 31 studies for funding in 2002, including 14 stock status and trends studies and 17 harvest monitoring and TEK studies **(Tables 1 & 2).**

The 31 studies represent a balanced mix of studies that address Regional Council concerns, improve and strengthen fisheries management, quantify harvests, employ traditional ecological knowledge, and address regulatory actions before the Board. All studies are technically sound and expand upon the science-based monitoring program initiated in 2000 and 2001. For the 2002 studies recommended for funding by the TRC, approximately 40% of the funding would

be directed at tribal and local organizations (Non–governmental Organizations or NGO), approximately 40% to ADF&G, and approximately 20% to federal agencies **(Figure 2).** Recommendations by the Technical Review Committee represent the Draft Resource Monitoring Plan for 2002, and we look forward to gaining input from the Regional Councils and the public.

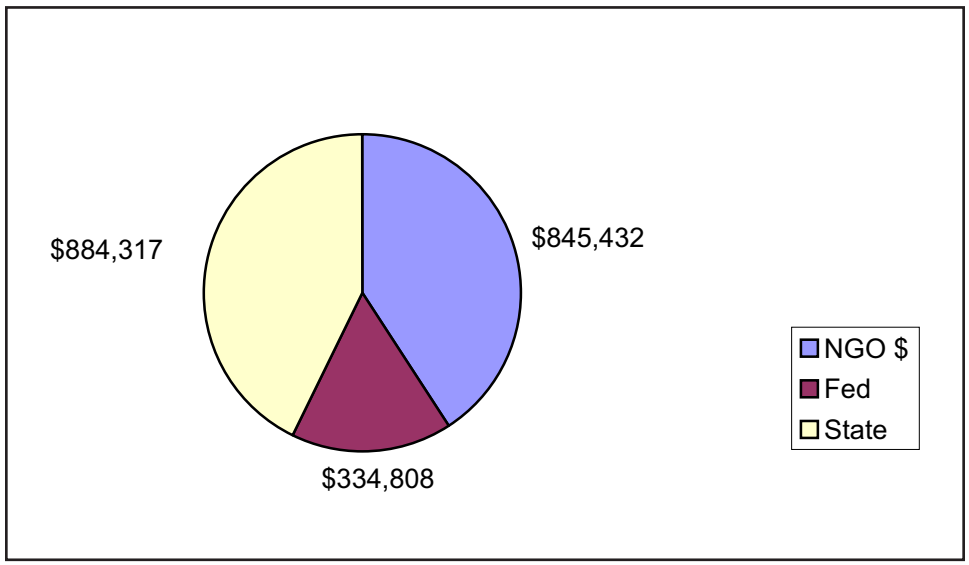
How to Provide Your Comments

We invite your review and comments on the draft 2002 Fisheries Resource Monitoring Plan. Regional Council members will have an opportunity to review the Monitoring Plan during Council meetings in the fall of 2001.

The Board welcomes your comments by October 31, 2001. These will be compiled along with the Regional Council comments and will be presented to the Board when it meets in December. Written comments may be submitted to:

USFWS Office of Subsistence Management
Attn: Richard Cannon
3601 C Street, Suite 1030
Anchorage, Alaska 99503
telephone: 1-800-478-1456 Fax: 907-786-3898
e-mail: Richard_Cannon@fws.gov

Figure 2. 2002 Funding Distribution



BRISTOL BAY-ALASKA PENINSULA AND KODIAK-ALEUTIANS

OVERVIEW

Issues and Information Needs

- Regional Advisory Councils for the Bristol Bay-Alaska Peninsula/Kodiak-Aleutians region have identified a variety of issues and information needs. There continues to be substantial interest in stock assessment, particularly on salmon; subsistence harvest patterns; and Traditional Ecological Knowledge documentation and use.

- The Federal Subsistence Board decided it would not fund studies dealing with fisheries propagation, restoration, enhancement, and supplementation; habitat protection, restoration, and enhancement; or contaminant assessment, evaluation, and monitoring.

- Some information needs and issues identified by the Regional Advisory Councils concern matters that are outside federal subsistence fishery management authority (for example, Nushagak River fishery resources), or that are more properly addressed by other federal or state agencies (for example, marine mammal assessment and trespass on private lands).

- Three 2002 regulatory proposals could influence Bristol Bay-Alaska Peninsula or Kodiak-Aleutians area residents. One statewide proposal seeks to change existing subsistence fishery practices; a second statewide proposal seeks to establish a new federal subsistence permit for marine fishes; and a Southcentral proposal seeks to establish subsistence fisheries in Tuxedni Bay, Lake Clark National Wildlife Refuge.

- Within Bristol Bay, sockeye salmon runs to the Kvichak River system continue to be viewed as stocks of concern due to low returns. Spawning components of this run returning to Lake Clark National Park and Preserve are of interest to federal subsistence users.

- Within the Alaska Peninsula National Wildlife Refuge, the coho run to Kametalook River no longer supports subsistence harvests, and residents harvesting late-run sockeye returning to Clark River report they are expending more effort to meet subsistence needs.

- Within Kodiak Island marine waters, red king crab abundance has been low for many years. Womens Bay, Alaska Maritime National Wildlife Refuge, is one of the few locations that still supports limited subsistence harvests.

Studies Forwarded for Investigation Plans

- The Technical Review Committee advanced a total of nine studies for Investigation Plan development. These studies would be located throughout this region (**Map 1**).

- A total of $608.3 thousand would be needed to fund these studies in fiscal year 2002, while only $213.0 thousand is available (**Tables 1, 2, and 3**).

Locations of Projects Advance for Preparation of Investigation Plans

Bristol Bay, Alaska Peninsula, Kodiak

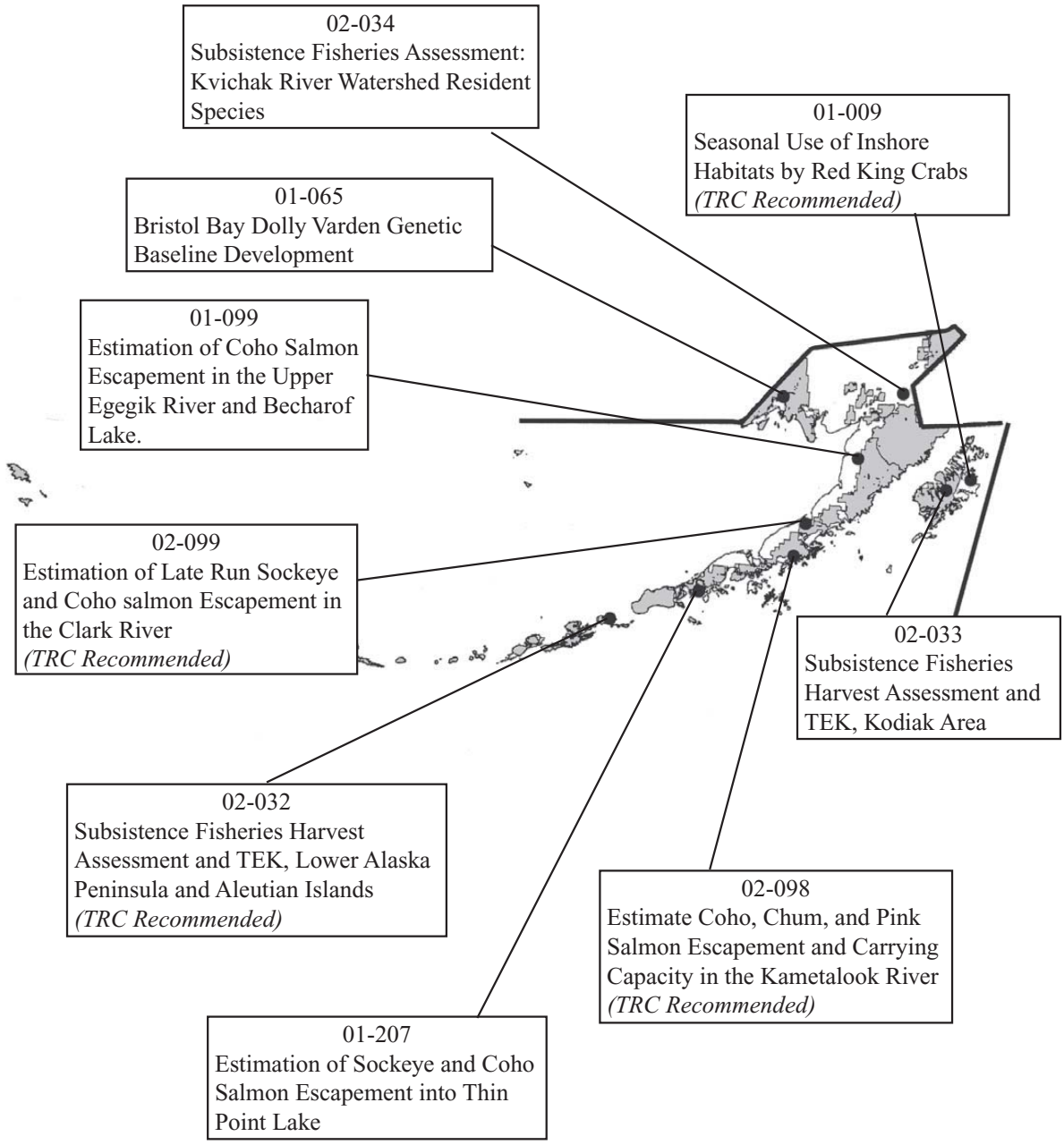


Table 1. Proposed selection of FY 2002 Bristol Bay-Alaska Peninsula and Kodiak-Aleutians stock status and trends investigation plans for consideration. Proposed selections are shown with bold type and noted with a "Yes" in the "Selection" column.

			Requested Budget		
FIS#	Title	Selected	2002	2003	2004
	Bristol Bay-Alaska Peninsula				
	Salmon Biology and Assessment				
01-099	Estimation of Coho Salmon Escapement in the Upper Egegik River and Becharof Lake, Becharof National Wildlife Refuge	No	$95.7	$93.3	$97.6
02-098	**Estimate Coho Salmon Escapement an Carrying Capacity in the Kametalook River, Alaska Peninsula Refuge**	**Yes**	**$24.3**	**$33.5**	**$27.0**
02-099	**Estimation of Late Run Sockeye and Coho Salmon Escapement in the Clark River, a Tributary to Chignik River, Alaska Peninsula National Wildlife Refuge**	**Yes**	**$44.1**	**$29.4**	**$7.7**
	Char Stock Structure				
01-065	Bristol Bay Dolly Varden Genetic Baseline Development	No	$101.4	$141.4	$55.4
	Kodiak-Aleutains				
	Salmon Biology and Assessment				
01-207	Estimation of sockeye and coho salmon escapement into Thin Point Lake, Izembek National Wildlife Refuge	No	$74.9	$69.0	$71.3
	Shellfish Assessment				
01-009	**Seasonal Use of Inshore Habitats by Red King Crabs**	**Yes**	**$65.5**	**$17.0**	**$9.5**
	GRAND TOTALS		$405.9	$383.6	$268.5
	TARGET BUDGET LEVELS		$142.0	$163.4	$346.5
	PROPOSED SELECTIONS		**$133.9**	**$79.9**	**$44.2**

Table 2. Proposed selection of FY 2002 Bristol Bay-Alaska Peninsula-Kodiak harvest monitoring and Traditional Ecological Knowledge investigation plans for funding consideration. Proposed selections are show with bold type, and noted with a "Yes" in the "Selection" column.

			Requested Budget		
FIS #	Title	Selected	2002	2003	2004
	Bristol Bay- Alaska Peninsula				
02-034	Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species	No *a*	$30.9	$43.3	
	Bristol Bay- Alaska Peninsula/Kodiak-Aleutians				
02-032	**Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Lower Alaska Peninsula and Aleutian Islands**	**Yes** *b*	**$91.4**	**$63.8**	
	Kodiak-Aleutians				
02-033	Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Kodiak Area	No	$80.1	$76.3	
	GRAND TOTALS		$202.4	$183.4	$0.0
	TARGET BUDGET LEVELS		$71.0	$144.0	$173.6
	PROPOSED SELECTIONS		**$91.4**	**$63.8**	**$0.0**

a This study reached the investigation plan stage in 2001 as 01-108, but was modified for 2002.

b The investigation plan for this study was modified to include components of study 02-032 that developed Traditional Ecological Knowledge information for listed communities. Investigators will work as partners to accomplish this work. Only two years of funding are recommended to complete this work.

Table 3

FY 2002 Bristol Bay, Kodiak Island, Alaska Peninsula Projects

Region 4. Bristol Bay, Alaska Peninsula, Kodiak

Type A . Stock Status & Trends

Doc #	Agency/Org	Title	NGO $	Fed$	State $	Total $
01-009	NMFS	Seasonal use of inshore habitats by red king crabs (Paralithodes camtschaticus)	$0.00	$65,482.00	$0.00	$65,482.00
01-065	USFWS, ADFG-SFD	Bristol Bay Dolly Varden Genetic Baseline Development	$0.00	$72,000.00	$29,414.00	$101,414.00
01-099	USFWS, ADFG-SFD	Estimation of coho salmon escapement in the upper Egegik River and Becharof Lake, Becharof National Wildlife Refuge	$0.00	$81,776.00	$13,894.76	$95,670.76
01-207	ADFG, Agdaax	Enumeration of sockeye and coho salmon escapement into Thin Point Lake, Izembek National Wildlife Refuge	$17,462.00	$0.00	$57,471.00	$74,933.00
02-098	USFWS, BBNA	Carrying capacity of habitats used seasonally by coho salmon in the Kametolook River, Alaska Peninsula National Wildlife Refuge	$9,160.00	$15,154.00	$0.00	$24,314.00
02-099	USFWS, BBNA	Estimation of late run sockeye and coho salmon escapement in the Clark River, a tributary to Chignik Lake, Alaska Peninsula National Wildlife Refuge	$11,394.00	$32,707.00	$0.00	$44,101.00
Total			$38,016.00	$267,119.00	$100,779.76	$405,914.76

Type B. Harvest Monitoring/TEK

Doc #	Agency/Org	Title	NGO $	Fed$	State $	Total $

- In making funding recommendations, the Technical Review Committee considered strategic needs for the information, technical merits of the study, performance ability of investigators, and contributions to local partnership and capacity building.

Selection Process – Stock Status and Trends Studies

- Six studies were advanced for Investigation Plan development in the Stock Status and Trends category (**Table 1**). These studies address one general issue of Distribution, Abundance, and Life History of Fish Species. Of these studies, four concern salmon assessment, one concerns Dolly Varden stock structure, and one concerns shellfish assessment.

- Funding requested for stock status and trends studies totaled approximately $405.9 thousand for fiscal year 2002, while a total of $142.0 thousand is available.

- To make funding recommendations, the Technical Review Committee considered strategic needs for the information, technical merits of the study, performance ability of investigators, and contributions to local partnership and capacity building.

- The Technical Review Committee recommended three projects for funding in fiscal year 2002 (**Table 1**). Total cost for these projects in fiscal year 2002 is expected to be about $133.9 thousand, which is about 6% less than the target budget level.

- The Technical Review Committee further recommended that unallocated 2002 Stock Status and Trends funds be used to fund Harvest Monitoring and Traditional Ecological Knowledge studies for this region (see next section).

- Two of the recommended projects are salmon assessment studies for Alaska Peninsula systems: Kametalook River coho salmon, and Clark River late-run sockeye salmon. The third is a red king crab assessment study for Womens Bay, Kodiak Island.

- All three recommended projects are multiyear studies, but capacity is available for funding new studies in following years.

- The Technical Review Committee recommended one Inter-Regional Stock Status and Trends study for funding that would directly benefit subsistence fishery management within this region. This study would develop protocols and computer software to determine sustainable subsistence salmon harvest levels (See **Inter-Regional Overview** for more details).

Selection Process – Harvest Monitoring and Traditional Ecological Knowledge Studies

- Three studies were advanced for Investigation Plan development in the Harvest Monitoring and Traditional Ecological Knowledge categories (**Table 2**). These studies would address two general issues: *Subsistence Harvest Patterns* and *Subsistence Use and Practices.*

- Funding requested for Harvest Monitoring and Traditional Ecological Knowledge studies totaled $202.4 thousand for fiscal year 2002, while a total of $71.0 thousand is available.

- The Technical Review Committee selected projects to fund by considering strategic needs for the information, technical merits of the study, performance ability of investigators, and contributions to local partnership and capacity building.

- The Technical Review Committee recommended one project for funding in fiscal year 2002 (**Table 2**). Total cost for this project in fiscal year 2002 is expected to be about $91.4 thousand, which is about 29% more than the target budget level. Some of this cost would be covered with unallocated Stock Status and Trends funds for this region

- The recommended project addresses subsistence fishery harvests and Traditional Ecological Knowledge for the Lower Alaska Peninsula and Aleutian Islands.

- The recommended project is a multiyear study, but capacity is available for funding new studies in following years.

- The Technical Review Committee recommended one Inter-Regional Harvest Monitoring and Traditional Ecological Knowledge study for funding that would directly benefit this region. This study would integrate information from the State's Alaska Subsistence Fisheries Database into a Geographic Information System (See **Inter-Regional Overview** for more details).

Funding Recommendation Summary

- Four studies, three Stock Status and Trends studies and one Harvest Monitoring/Traditional Ecological Knowledge study, were recommended for funding with a cost of $225.3 thousand in fiscal year 2002 (**Tables 1, 2, and 3**).

- About 50% the funding for these four studies would go to non-government organizations and state agencies (**Figure 1**).

- About 9% of the funds for these four studies ($20.0 thousand) would be used for local hire, while investigators would contribute $107.0 thousand in matching funds (**Table 4**).

- Studies not recommended for funding this year address valid information needs and employ technically sound methods. Budget limitations meant that hard choices were necessary, and projects recommended for funding was considered to have greater strategic importance.

- Investigation plans not selected for funding this fiscal year will not automatically become eligible for funding consideration next fiscal year. Investigators will need to submit new proposals requesting funding for their work in fiscal year 2003.

Figure 1. Fishery Resource Monitoring Program FY 2002 Funding Distribution for Bristol Bay, Alaska Peninsula, and Kodiak Island

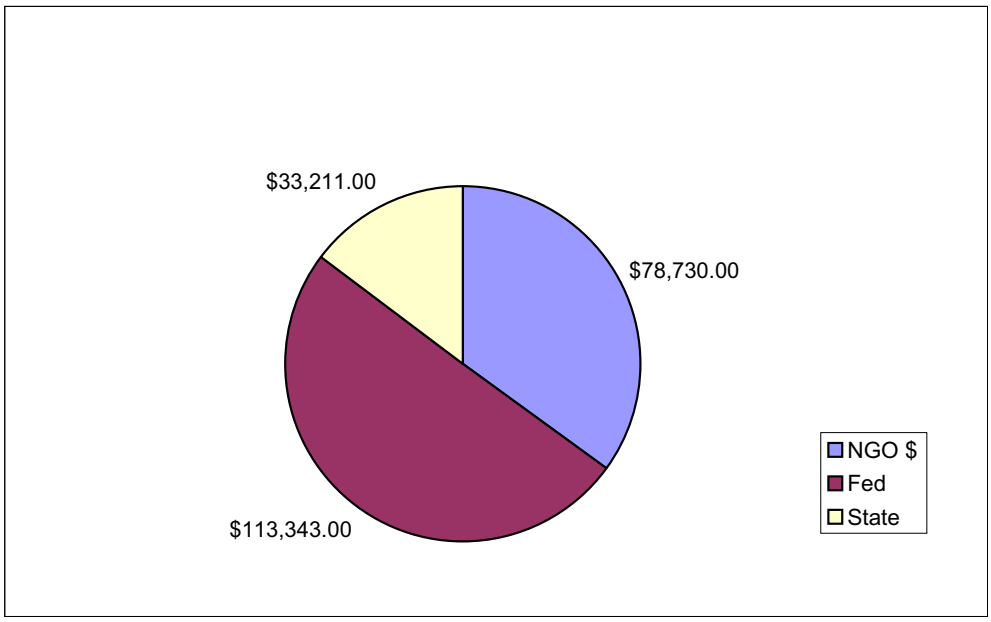


Table 4.

FY 2002 Local Hire and Matched Funds Report Bristol Bay

Region 4. Bristol Bay, Alaska Peninsula, Kodiak

Type A . Stock Status & Trends

Doc #	Agency/Org	Title	Local Hire $	Matched $
01-009	NMFS	Seasonal use of inshore habitats by red king crabs (Paralithodes camtschaticus)	$0.00	$6,000.00
01-065	USFWS, ADFG-SFD	Bristol Bay Dolly Varden Genetic Baseline Development	$10,000.00	$0.00
01-099	USFWS, ADFG-SFD	Estimation of coho salmon escapement in the upper Egegik River and Becharof Lake, Becharof National Wildlife Refuge	$23,246.00	$0.00
01-207	ADFG, Agdaax	Enumeration of sockeye and coho salmon escapement into Thin Point Lake, Izembek National Wildlife Refuge	$0.00	$0.00
02-098	USFWS, BBNA	Carrying capacity of habitats used seasonally by coho salmon in the Kametolook River, Alaska Peninsula National Wildlife Refuge	$2,235.00	$72,604.00
02-099	USFWS, BBNA	Estimation of late run sockeye and coho salmon escapement in the Clark River, a tributary to Chignik Lake, Alaska Peninsula National Wildlife Refuge	$7,600.00	$4,000.00
Total			$43,081.00	$82,604.00

Type B. Harvest Monitoring/TEK

Doc #	Agency/Org	Title	Local Hire $	Matched $
02-032	ADFG-SD, ISU, APIA	Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Lower Alaska Peninsula and Aleutian Islands	$10,200.00	$24,426.00
02-033	ADFG-SD, Kodiak Native Assoc	Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Kodiak Area	$10,000.00	$11,000.00
02-034	ADFG-SD, BBNA	Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species	$6,888.00	$17,880.00
Total			$27,088.00	$53,306.00
Grand Total			$70,169.00	$135,910.00

Study Recommendations, Descriptions, and Justifications

- Additional details about each project can be found in the sections that follow. For each project, we have included the Technical Review Committee recommendation, a project description, and the technical justification for the recommendation.
- Study information is organized into two sections. The first contains Stock Status and Trends studies information, while the second contains Harvest Monitoring and Traditional Ecological Knowledge studies information. Within each section, studies are organized by their assigned numbers, in increasing order.

Recommended For Funding

01-009

Seasonal Use of Inshore Habitats By Red King Crabs

Investigator(s): National Marine Fisheries Service, Kodiak Fisheries Research Center,

FY2002 Budget: $ 65,482.00 **Total Budget (3 years): $ 91,886.00**

Geographic Area: Kodiak-Aleutians **Information Type: SST**

Issues:

The status and conservation of the red king crab population subject to federally managed subsistence harvest in Womens Bay, within the Alaska Maritime National Wildlife Refuge, has become an issue of importance. Lack of information concerning movements, breeding, and seasonal habitat use by red king crab is coupled with local concern about crab population status, subsistence catch limits, and crab mortality due to lost crab pots and sea otters.

Objectives:

1) Install on-site system to monitor movements of red king crab tagged with ultrasonic transmitters.

2) Determine site fidelity, seasonal use, movement patterns, and residency time of red king crabs in Womens Bay.

3) Observe interactions of red king crab and lost crab pots, and interactions of sea otters with red king crab populations and habitats.

4) Obtain information on larval red king crab densities in Womens Bay with that of other Kodiak bays.

Methods:

This would continue and expand red king crab studies the investigators have been doing since 1990 in Womens Bay, a federally managed subsistence area in the Alaska Maritime National Wildlife Refuge. Ultrasonic transmitter tags have been placed on red king crabs, and their movements have been monitored from boats and through SCUBA diver observations. This study would allow the investigators to install an array of moored receivers within Womens Bay to allow more continuous, detailed tracking of red king crab carrying ultrasonic transmitter tags. Information collected by the moored receivers would be relayed to a land-based station and

stored on a computer. Boat and SCUBA diver observations would also be conducted during the study to supplement information obtained from the moored receivers. This would allow documentation of biological and physical information in the vicinity of tagged red king crab including the number abundance of untagged red king crabs, activity of tagged and untagged crab, growth rates of tagged crab, bottom substrate, interactions with lost crab pots, and presence and behavior of sea otters. SCUBA divers would also be able to recover tags from dead crabs or molted carapices, and to tag and release red king crabs in specific situations, such as within a traveling pod of crabs. These data would be used to better define seasonal habitat use, activity periods, movements, migrations, mortality and other aspects of red king crab life history within Womens Bay. The investigators would also try to determine whether Womens Bay serves as a red king crab nursery area by collecting plankton and other oceanographic data. This aspect of the study would be conducted in partnership with the Kodiak High School fisheries program and the University of Alaska School of Fisheries. The High School's 42 foot vessel would be used as a platform to collect this information, which would be compared with larval crab information obtained from other bays around Kodiak Island in conjunction with other studies.

Deliverables/Products:

The investigators would write and submit annual reports summarizing the data collected as well as a final report to the Office of Subsistence Management, Fisheries Information Services Division. The investigators would submit results for publication in a peer-reviewed scientific journal after completion of the study.

Experience of Investigator(s):

The investigators and their associates at the National Marine Fisheries Service, Kodiak Fisheries Research Center, have conducted and published a variety of research on the biology of and fisheries for red king crab, including studies using ultrasonic tags and SCUBA diver observations. Investigators conducting dive operations have been trained and certified as Working Divers by the National Oceanic and Atmospheric Administration, and have logged over two thousand dives in coldwater environments. They have an extensive array of dive equipment, including boats and air compressors, and a dive facility to support SCUBA operations for this study.

Partnerships/Collaboration/Consultations:

Investigators will be working with the Kodiak High School fisheries class and the University of Alaska School of Fisheries to conduct work on red king crab larval densities and oceanographic conditions of Womens Bay and to compare this information with that collected from other Kodiak Island bays. Consultations in planning this study were conducted with two members of the Kodiak-Aleutians Regional Advisory Council, and staff from Kodiak High School, University of Alaska, U.S. Fish and Wildlife Service (Alaska Maritime National Wildlife Refuge, Kodiak National Wildlife Refuge), and Alaska Department of Fish and Game (Kodiak Area Office).

Justification:

While the Regional Advisory Council did not specifically list red king crab as an issue, local residents and some council members have expressed interest in obtaining more information on this resource. Women's Bay, Kodiak Island, is within the Alaska Maritime National Wildlife Refuge and is a popular location for local subsistence users. Abundance of red king crab has been declining for several years and subsistence harvest is limited to six per household. This study would provide information on red king crab daily and seasonal movements, breeding behavior, and habitat use. Information on crab mortality due to continued fishing of lost pots and sea otter predation would also be obtained. All this information would be of use in determining whether Women's Bay has a resident population of red king crab, the importance of this area as a rearing site, and the effect of current harvest levels on stock recovery. The study appears well designed, although, as with most telemetry studies, the number of tracked animals would be relatively small: about 40 ultrasonic tags would be deployed during the study. If successful, use of remote receivers to continuously monitor red king crab movements would provide detailed daily movement information that would otherwise be more costly and personnel-intensive to collect. Fund matching for this work is very good. Requested funding is probably two thirds or less of the total cost to conduct this work since National Marine Fisheries Service would cover costs for most personnel as well as diving equipment, boat fuel, consumables, and a new computer for tracking crabs. This study would build upon work on red king crab biology in Women's Bay, Kodiak, begun by the National Marine Fisheries Service in 1990. The investigators and their agency appear very well qualified technically and administratively to conduct and complete this study. Consultations have been conducted with other agencies, two members of the Regional Advisory Council, and staff of Kodiak High School and University of Alaska Kodiak. Local capacity building aspects of the study have been improved, and would consist of public access to information from this study as well as providing opportunities for local high school and university students to obtain hands-on experience with portions of field operations and data analysis. The budget for this three-year study was modified and reapportioned, as requested after proposal review, to fit within funding constraints, since only about $70,000 is available for Kodiak-Aleutians stock status studies in 2002. To accomplish this, investigators reduced some costs and reapportioned expenditures among years to keep within suggested budget guidelines.

Not Recommended For Funding

01-065

Bristol Bay Dolly Varden Genetic Baseline Development

Investigator(s): U.S. Fish and Wildlife Service, Fish Genetics Laboratory, King Salmon Fishery Resource Office, and Togiak National Wildlife Refuge; Alaska Department of Fish and Game, Sport Fish Division

FY2002 Budget: $ 101,414.00 **Total Budget (3 years): $ 298,232.00**

Geographic Area: Bristol Bay-Alaska Peninsula Information Type: SST

Issues:

Dolly Varden is harvested in subsistence fisheries throughout the Bristol Bay region. The largest harvest occurs in the Togiak River, within Togiak National Wildlife Refuge, where about

11,000 Dolly Varden are harvested each year. Dolly Varden is an anadromous fish and undertake complicated migrations. In past studies, Dolly Varden tagged in the Togiak River have been recaptured in fisheries occurring in other Bristol Bay drainages as well as in the Kuskokwim and Yukon Rivers. Harvests usually occur on mixed stocks, so information on stock contributions to harvests is needed to sustain these stocks and the subsistence fisheries, which harvest them. This project would begin establishment of a comprehensive genetic baseline for Dolly Varden in Bristol Bay.

Objectives:

1) Obtain genetics samples from at least eight Dolly Varden spawning populations within Bristol Bay.

2) Characterize population structure using genetic markers developed specifically for Dolly Varden in previous studies.

3) Construct a genetic baseline and test its performance for conducting mixed stock analyses.

4) Develop a final plan for the construction of a comprehensive Bristol Bay genetic baseline, and make recommendations for mixed-stock applications such as harvest assessments, mapping migratory corridors, and stock-specific use of wintering areas.

Methods:

Fin tissue samples from at least eight collections of adults on or near spawning grounds would be obtained in 2001 and 2002. All sampled Dolly Varden would be released to spawn. Collections would be planned to cover a broad expanse of Bristol Bay so that population structure could be examined on a broad geographic scale. Laboratory processing of samples would develop genetic profiles for all collections. This information would be combined with other available Bristol Bay Dolly Varden baseline data to examine and test population structure of about 11 spawning populations. Results would be used to determine whether baseline information would allow identification of individual spawning populations from samples of mixed populations. A plan for completing the baseline for Bristol Bay would be developed, and recommendations for using the baseline to provide fisheries management information would be provided.

Deliverables/Products:

A report would be written each year that would include collected information and a summary of the project. After three years, a final report would be completed on all aspects of the study. The genetic baseline would be available as an electronic file, while tissue samples would be archived for future use.

Experience of Investigator(s):

U.S. Fish and Wildlife Service would provide a staff with a broad range of fisheries knowledge within the Bristol Bay-Alaska Peninsula area. The Fish Genetics Laboratory staff has extensive experience in developing and using genetics techniques for management, conservation, restoration, and recovery of fishes. The King Salmon Fishery Resources Office staff has a long history of performing fisheries work in this region. are familiar with local fisheries and fishery issues, are experienced in applying of a variety of fisheries methods, and specialize in population monitoring and survey projects. The Togiak National Wildlife Refuge staff has extensive experience planning and implementing fisheries projects in remote areas and under adverse conditions. Their knowledge of Dolly Varden spawning areas would be particularly helpful in planning and conducting field collections.

Alaska Department of Fish and Game, Division of Sport Fish staff also have a long history of conducting fisheries work in this area, including population assessments and monitoring using a variety of fisheries techniques. Their knowledge of the Bristol Bay region and the locations of Dolly Varden spawning grounds, as well as their experience in conducting field operations would be of great use in meeting project objectives.

Partnerships/Collaboration/Consultations:

Consultations have occurred among the various agencies involved in this study as well as with local organizations such as Becharof Corporation, Egegik Village Tribal Council, and Ugashik Traditional Village. Partnership and capacity building would be achieved through provision of opportunities for qualified college interns from local communities to assist in the Fish

Genetics Laboratory as well as through hiring local residents to serve as field technicians. Information collected would be shared with local organizations and management agencies through distribution of written reports.

Justification:

Funding requests for stock status and trends studies in this region greatly exceeded available resources for fiscal year 2002, so difficult selection decisions had to be made. While this study was judged to be technically sound, its strategic importance was felt to be less than that of some other studies. This study would expand work on Bristol Bay char genetics, begun on Togiak River system in 2000 (FIS 00-011), to eight other spawning populations. Subsistence users, as well as sport anglers, have expressed concerns about a perceived decline in abundance and size of char in various Bristol Bay systems, but subsistence needs appear to have been met. While viewed as a lower priority than other studies funding in 2001, the Bristol Bay Regional Advisory Committee requested, unsuccessfully, that the Federal Subsistence Board move funding from 2001 Inter-Regional studies to fund this work. Due to the complex migratory patterns exhibited by Dolly Varden, information on stock structure and stock mixing would help ensure that harvests of this species continue to be sustained. If suitable markers could be developed, the genetic baseline could be used to conduct mixed stock harvest assessments, identify migratory corridors, and evaluate stock-specific use of over-wintering habitat. The study appears to be technically sound, and the investigators and their agencies are very qualified to administer and conduct this type of work. One of these investigators has been involved in similar efforts in the Arctic in 2000 (FIS 00-001) and 2001 (FIS 01-136 and 113). Field, laboratory and analytical techniques proposed for use have been developed and applied to various fish species in Alaska and elsewhere. The U.S. Fish and Wildlife Service's Region 7 Genetics Laboratory is well staffed and equipped to develop genetic baselines and conduct mixed stock analyses. Staff in U.S. Fish and Wildlife Service Fishery Research Offices and Alaska Department of Fish and Game would collect samples and help interpret results. Consultations were conducted with local Native villages, councils, and corporations. Capacity building consists of hiring local residents to assist in collecting and processing samples, as well as distributing information obtained in reports.

Not Recommended For Funding

01-099

Estimate of Coho Salmon Escapement in the Egegik River, Becharof National Wildlife Refuge

Investigator(s): King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service

FY2002 Budget: $ 95,670.76 **Total Budget (3 years): $ 286,620.00**

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type: SST**

Issues:

Lack of information concerning the abundance and migratory timing of coho salmon entering the Egegik River to spawn hinders management of coho salmon stocks in this drainage, much of which lies within Becharof National Wildlife Refuge. Inseason spawning escapement estimates would help fishery managers better regulate commercial and sport harvests to ensure that a sufficient number of coho salmon were available for subsistence users as well as spawning needs. Accurate post-season estimates would help managers set spawning goals and evaluate management strategies. Spawning escapement information would also allow concerns about over-harvesting this resource to be more reasonably addressed, help resolve conflicts among subsistence, sport, and commercial users, and aid the Bristol Bay Regional Advisory Council and Federal Subsistence Board in evaluating regulatory proposals.

Objectives:

1) Estimate daily and annual spawning escapement of coho salmon into the Becharof Lake drainage of the Egegik River system.

2) Estimate the age and sex composition of the coho salmon spawning above the counting site such that simultaneous 90% confidence intervals have a maximum width of 0.20.

3) Estimate mean length, by age and sex, of coho salmon spawning above the counting site.

Methods:

This project would extend counting operations at an existing tower site, used by Alaska Department of Fish and Game, Division of Commercial Fisheries to count sockeye salmon spawning escapement, to obtain counts of coho salmon. This site would provide escapement counts for

coho salmon entering Becharof Lake and associated drainages to spawn. This would not provide a spawning escapement estimate for the entire Egegik River, since coho salmon are also known to spawn below the counting site within the King Salmon River, but it would provide an estimate for the portion of the Egegik River drainage lying within Becharof National Wildlife Refuge. Coho counting operations would begin about mid-July and end in late September. Coho salmon counting methods would follow protocols established over several decades for counting sockeye salmon. This would entail making 10-minute counts of salmon every hour of each calendar day from each bank of the river. Hourly passage estimates would be obtained by multiplying ten-minute counts by six. A colored metal panel would be set on the river bottom below each tower to enhance visibility of salmon to observers. Observers would improve their ability to see salmon by wearing polarized sunglasses to reduce glare during the day, and using artificial lighting during hours of darkness. If an hourly count is missed, the mean hourly passage for the same time period during previous and subsequent day would be used as an estimate. Salmon would be sampled to obtain age, sex, and size information using a beach seine. Sampling would be conducted three to five times each week during the project. A total of 138 coho salmon would be sampled each week to ensure that weekly estimates of the age composition have simultaneous 90% confidence intervals with a maximum width of 0.20. During weeks with low salmon passage, when it is not possible to capture 138 coho salmon, about 20% of the passage would be sampled. Ages would be determined from scale samples by Alaska Department of Fish and Game staff. All information collected will be entered onto existing Alaska Department of Fish and Game forms.

Deliverables/Products:

A detailed description of methods, data, results and accomplishments, as well as any proposed changes in design or methods, would available each year as a Fish and Wildlife Service Data Series Report in paper and electronic format. Escapement data would also be provided to the Alaska Department of Fish and Game for inclusion in the Bristol Bay Annual Management Report series. Copies of these reports would be provided to the Office of Subsistence Management, as well as the Alaska Resources Library Information System (ARLIS).

Experience of Investigator(s):

Staff at both the U.S. Fish and Wildlife Service, King Salmon Fishery Resource Office and Alaska Department of Fish and Game have experience operating salmon counting tower projects, including training in sampling salmon populations to obtain age, sex, and information.

Partnerships/Collaboration/Consultations:

The Egegik Village Council would help recruit two local residents to assist in operating this project. These people would be trained in all aspects of counting tower operations so that they can become field crew leaders in future years. As local expertise and capacity is developed, the long-term goal would be to have local residents supervise, operate, and report data from the project.

Justification:

Funding requests for stock status and trends studies in this region greatly exceeded available resources for fiscal year 2002, so difficult selection decisions had to be made. While this study was judged to be technically sound, its strategic importance was felt to be less than that of some other studies. This study was previously submitted for fiscal year 2001, but a coho salmon study using similar methods was funded for Ugashik River (FIS 01-204) because it was considered to be of greater strategic priority. Coho salmon management is an important issue with the Egegik Village and local subsistence users, since coho salmon returning to Egegik River system are harvested in subsistence, recreational, and commercial fisheries. Spawning escapements most years have been monitored through aerial surveys, but management precision could be improved with access to accurate daily counts. Many salmon runs have been declining in western Alaska systems, so obtaining more accurate counts of coho salmon spawning in the Egegik drainage would help to ensure subsistence harvest opportunities and runs are sustained. This is a relatively straightforward study that relies on methods initially developed by University of Washington and that have been refined and used many years by Alaska Department of Fish and Game. Tower counts of coho salmon entering Egegik system were made in 1994, 1995 and 1996, but dedicated funding to continue this work has not been available. There appears to be an error in citing tower and aerial counts on page 2 of the Investigation Plan. The author states tower "estimates for coho salmon were 7,412, 5,258, and 24,918 during 1994, 1995, and 1996…" and "corresponding aerial surveys during the same years were 7,412, 5,258 and 9,043…". It is very unlikely tower and aerial counts were exactly the same in two years. Aerial counts and tower counts would need to be compared for all years of this study, as well as the available three past years, to determine whether a significant relationship existed. Such a relationship could be used to estimate past escapements in years when only aerial surveys were made or to estimate future escapements if continued funding for a tower project was not available. The investigator and his agency appear technically and administratively qualified to conduct this work. Consultations have occurred with other agencies as well as local organizations. Capacity building would consist of hiring and mentoring local residents and distributing information.

Not Recommended For Funding

01-207

Enumeration of Sockeye and Coho Salmon Escapement Into Thin Point Lake, Izembek National Wildlife Refuge

Investigator(s): Division of Commercial Fisheries, Alaska Department of Fish and Game; King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service; Agdaax Tribe

FY2002 Budget: $ 74,933.10 **Total Budget (3 years):** $ 215,298.00

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type:** SST

Issues:

The Alaska Department of Fish and Game operated a weir at this site from 1994 through 1998, but discontinued operations due to fiscal constraints. Lack of inseason salmon spawning escapement information for this system makes it difficult to ensure that adequate escapement is obtained and subsistence needs are satisfied.

Objectives:

1) Enumerate daily passage of sockeye and coho salmon into Thin Point Lake.
2) Document sockeye and coho salmon run timing (daily proportion of total run) at the weir.
3) Estimate sex and age compositions of sockeye and coho salmon such that simultaneous 90% confidence intervals have a maximum width of 0.20.
4) Estimate mean length of sockeye and coho salmon within each age class by sex.
5) Confirm that sockeye and coho salmon runs are adequate to allow subsistence fishing.
6) Confirm that sockeye and coho salmon runs are adequate to allow commercial fishing.
7) Provide protection to salmon aggregations in Thin Point Lagoon from illegal harvest.
8) Monitor and administer the subsistence fishery.

Methods:

A picket weir consisting of a frame set on the streambed with wooden tripods and aluminum panels with welded sections of pipe will be used. The weir would be installed and operational by July 15. The field crew would inspect, repair, and clean the weir each day. They would also monitor the subsistence fishery in the lagoon and the commercial fishery in the cove from a tent platform set up on the beach. Alaska Department of Fish and Game staff would operate the project from July 1 through September 15. After that date, U.S. Fish and Wildlife Service staff would assume these responsibilities through the end of the field season, through October 15, if aerial logistic support were available. Salmon would be passed through the weir and counted intermittently each day depending on abundance. Separate counts would be maintained for each species. Standardized forms would be used to record all data, including the time the gate was opened and closed, species counts, and remarks concerning weather, water temperature, water levels, and any problems with the weir. Daily and cumulative counts for each species of salmon would be provided via radio each morning to Alaska Department of Fish and Game managers stationed in Cold Bay. Cumulative weir counts, along with aerial estimates of salmon below the weir in the lagoon, would be compared to aerial and weir data from past years to assess total run abundance and timing. Fishery managers would use this information to regulate commercial fishing periods to ensure enough salmon escape to spawn and provide subsistence harvest needs. Data on sockeye and coho salmon age, sex, and length would be collected using a stratified sampling design, using statistical weeks as strata. Efforts would be made to sample 240 sockeye and 120 coho salmon each week. These salmon would be collected over the shortest possible time period at the start of each sampling week. Salmon would be captured periodically throughout a sampling day. All salmon captured would be sampled, even if the sampling goal were exceeded, to avoid biasing the sample. During times of low salmon abundance, attempts would be made to sample about 20% of all sockeye and coho salmon passing the weir. This plan should result in large enough samples to estimate the age composition of both sexes of sockeye and coho salmon such that simultaneous 90% confidence intervals have a maximum width of 0.20.

Deliverables/Products:

A detailed description of methods, data, results and accomplishments, as well as any proposed changes in the investigation plan, would available each year as an annual report in paper and electronic format. Escapement data would also be included in the Alaska Department of Fish and Game's Kodiak-Aleutians Annual Management Report series. Copies of these reports would be provided to the Office of Subsistence Management, as well as the Alaska Resources Library Information System.

Experience of Investigator(s):

Staff at Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service, King Salmon Fishery Resource Office has experience operating salmon weir projects, including sampling salmon populations to obtain age, size, and sex information. Alaska Department of Fish and Game technicians who determine ages from salmon scale patterns receive special

training and are tested annually for their proficiency. The Alaska Department of Fish and Game technician who acted as the crew leader on this project in 1998 is still on staff and available to work on this project. The Agdaax Tribe has the administrative ability to hire and support a second crew person to assist the crew leader in operating the weir.

Partnerships/Collaboration/Consultations:

This project would facilitate closer working relationships among Alaska Department of Fish and Game, U.S. Fish and Wildlife Service and the Agdaax Tribe. The Alaska Department of Fish and Game crew leader would act as a mentor to train local residents hired as technicians. This would prepare them to serve as future crew leaders, and allow the Agdaax Tribe to gain increased control of this project in future years.

Justification:

A similar study (FIS 01-206) for Mortenson Creek, another system within Izembek National Wildlife Refuge, was funded in 2001. The Mortenson Creek project was considered to be of higher strategic priority since it had a greater subsistence harvest of sockeye salmon, a higher potential for conflicts between subsistence users and sport anglers, and a greater uncertainty in achieving adequate salmon escapements than Thin Point Lake. Spawning escapements into Thin Point have been monitored by aerial surveys, but management precision could be improved if accurate daily counts could be obtained at a weir. Sockeye and coho salmon returning to Thin Point Lake are harvested in subsistence, recreational, and commercial fisheries. This is one of the few areas where subsistence users from King Cove and Cold Bay can harvest sockeye salmon. While current harvest levels seem sustainable, the Alaska Department of Fish and Game has been concerned with illegal commercial fishing in this area. Operating a weir might deter illegal activities by having staff in the area. This would be a relatively straightforward study, and a weir was operated at this site by the Alaska Department of Fish and Game from 1994-1998. One review familiar with this area expressed some concern that high water events commonly occur that could make it difficult to operate a weir. Objectives 5 and 6 should be combined and stated as "Estimate annual exploitation rates and determine whether they are sustainable." Investigators would need to consult the sampling protocols and methods developed and recommended by Dr. Bromaghin, a U.S. Fish and Wildlife Service Region 7 Biometrician and former Alaska Department of Fish and Game Biometrician, to determine whether modifications are needed to their sampling plans. The investigator and his agency appear technically and administratively qualified to conduct this work. Consultations have occurred with King Cove Corporation and Agdaagux Tribe of King Cove. Capacity building would consist of local assistance in building the weir, hiring and mentoring local residents to operate the weir, future expectations for greater local project control, and distribution of information. It may be difficult to find local residents to train and eventually operate this project if it were funded, since local residents could not be found to fill field positions for the Mortensen Creek study in 2001. The submitted budget did not include indirect costs the State has requested for administering Fishery Monitoring Program studies.

Recommended For Funding

02-098

Carrying capacity of habitats used seasonally by coho salmon in the Kametolook River, Alaska Peninsula National Wildlife Refuge

Investigator(s): King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service; Bristol Bay Native Association

FY2002 Budget: $ 24,314.00 **Total Budget (3 years):** $ 84,861.00

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type:** SST

Issues:

Local residents have been unable to harvest enough coho salmon to meet subsistence needs, and the local community has prohibited residents from harvesting this species within the Kametalook, Three Star, and Long Beach River drainages, which once supported annual harvests of about 1,000 to 2,000 coho salmon. At least two factors have been suggested as the cause for continuing low returns of coho salmon to this drainage: decreased carrying capacity caused by past natural alterations in the habitat, and excessive harvest of adults. However, there is a lack of information that can be used to determine the cause(s) and develop a solution to this problem.

Objectives:

1) Inventory the physical habitat of the Kametalook, Three Star, and Long Beach River drainages, and use data to estimate seasonal carrying capacities of spawning, rearing, and wintering habitats for coho salmon.

2) Calculate a minimum spawning escapement index of coho salmon in the Kametalook, Three Star, and Long Beach rivers through ground surveys.

3) Estimate juvenile coho salmon densities in specific habitat types, and compare these data with values reported in the literature and habitat availability data collected as part of this study.

4) Compare information collected from the Kametalook, Three Star, and Long Beach River drainages with similar information collected from Clear Creek, a similar drainage about 80 miles to the north that continues to supports a run of several thousand coho salmon.

Methods:

The investigators would measure the quantity and quality of adult spawning and juvenile rearing habitat for coho salmon in the Kametalook, Three Star, and Long Beach rivers near Perryville, Alaska using a modified approach of the stream survey method developed by other investigators working on coho salmon in Pacific Northwest coastal streams. Stream survey data would be used to conduct a limiting habitat analyses for coho salmon in these drainages. This method, developed by other investigators, would use habitat data to model survival of a single cohort over time, by life-stage and season, to identify factors that could limit smolt production. The model is based on the assumption that when a needed habitat type is in short supply, a bottleneck to production could develop that would subject a cohort to density-dependent mortality, and that could lead to an under-utilization of other habitats by subsequent life history stages. Density independent survival rates for each life history stage would be taken from the literature. Information collected during this study would be compared with similar information collected from Clear Creek, located 60 miles northeast of Chignik, Alaska. Clear Creek has many similar physical characteristics to the Kametalook drainage, but continues to support a run of several thousand coho salmon. Work on Clear Creek is being conducted with funds from other sources.

Deliverables/Products:

The King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service, would be responsible for quality assurance, data analysis (including determining factors limiting coho salmon production), and writing reports. Interim and final reports would be provided to the Office of Subsistence Management, Fisheries Information Services Division. Results would be published in U.S. Fish and Wildlife Service, Alaska Fisheries Data Series reports in both electronic (Adobe Acrobat) and paper formats, and information would also be available for presentation to interested parties. Data would be archived according to King Salmon Fishery Resource Office standards.

Experience of Investigator(s):

The Bristol Bay Native Association has extensive experience and commitment in identifying and promoting the resource needs and priorities for villages within the region served. Bristol Bay Native Association is fully capable of assuming administrative responsibilities for this project, and currently conducts and supports several projects in southwest Alaska.

King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service, has extensive experience in conducting fisheries studies in southwest Alaska. Staff at King Salmon Fishery Resource Office are fully qualified and prepared to conduct this project. All biologists have advanced degrees with over 40 years of combined professional experience.

Partnerships/Collaboration/Consultations:

Bristol Bay Native Association and King Salmon Fishery Resource Office would jointly conduct this project. Perryville Village supports the project, and the use of local residents to serve as

fishery technicians would be required to successfully conduct this project. This project would encourage local involvement in solving management problems for local salmon stocks.

Justification:

The strategic importance of conducting this study is high, since the coho salmon run to this system has declined precipitously, and local subsistence users are no longer able to meet their needs. The cause for this decline in abundance is not known, but available information suggests it may be due to geologic and environmental conditions coupled with excessive fishing. The State has had limited success in its attempts to rebuild coho salmon runs using instream egg incubators, and much of last year's return of several hundred coho salmon was harvested, leaving few to spawn or for brood stock.

The original proposal was greatly improved by incorporating modifications suggested by reviewers. Proposed work would now focus entirely on coho salmon. Activities would consist of estimating escapement of adult coho salmon into the Kametalook, Three Star, and Long Beach Rivers based on ground surveys, and estimating available spawning and rearing habitat for coho salmon based on ground and underwater observations. The investigators would collect similar information for Clear Creek on Sutwik Island, about 80 miles northeast of Perryville. Clear Creek is supposed to be similar in size, morphology, and water conditions to Kametalook River and still supports a run of a few thousand coho salmon. If similar amounts of suitable spawning and rearing habitat exist in both Clear Creek and the Kametalook, differences in coho salmon production between these drainages would probably be due to differences in spawner abundance. Investigators should determine whether a time series of aerial photographs of these drainages is available. This type of information could help document habitat changes over time, and could prove useful in designing habitat surveys for this study.

Ground surveys to assess spawning escapement suffer from the same limitations faced during aerial surveys: water clarity, stream morphology, vegetative cover, and observer efficiency. The investigators proposed use of observer efficiency and stream life values from the literature, rather than estimating these parameters during the study, would result in unknown errors in adult coho salmon estimates. However, it may be possible to provide a rough idea of actual total escapement by using a range of "reasonable" observer efficiency and stream life values to bound these estimates. The investigators should consider obtaining information on suitable sites for a weir, tower or video system during this study, to determine whether these methods of counting adults are feasible.

Proposed juvenile salmon work could be very difficult to accomplish, particularly since juveniles are probably not abundant. If feasible, coho salmon smolt should be sampled. Since this life stage integrates all factors influencing freshwater survival, size and age of smolt could provide useful indications on freshwater rearing conditions. Consideration should be given to simplifying the habitat classification scheme presented in the investigation plan, since it was developed for Pacific Northwest streams at the southern end of the range of coho salmon.

Although review comments on the original proposal for this study indicated that collection of tissue samples for genetic work should not be included within the investigation plan, investigators are encouraged to contact the U.S. Fish and Wildlife Service Genetics Laboratory and the Alaska Department of Fish and Game Gene Conservation Laboratory to determine whether they have an interest in obtaining genetic samples from this salmon populations.

Consultations have occurred with local communities and residents. Partnership and capacity building would occur through mentoring and hiring local residents, and distributing information obtained through oral and written reports. The investigators have greatly reduced the amount of funding requested to accomplish this work, and have included Clear Creek work as a fund-matching component. While this work may not identify the reason for poor coho salmon production, some potential causes may be eliminated, a rough estimate of coho salmon production capacity could be obtained, and valuable partnerships would be developed that would improve resource management.

Recommended For Funding

02-099

Estimation of late run sockeye and coho salmon escapement in the Clark River, a tributary to Chignik Lake, Alaska Peninsula National Wildlife Refuge

Investigator(s): King Salmon Fishery Resource Office, U.S. Fish and Wildlife Service; Bristol Bay Native Association

FY2002 Budget: $ 44,101.00 **Total Budget (3 years):** $ 81,271.00

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type:** SST

Issues:

Late run sockeye salmon are important to the Chignik Villages subsistence harvest because these salmon preserve better than early run sockeye salmon. About 10,000 sockeye salmon are harvested near the Clark River mouth in Chignik Lake from September to November each year. Local subsistence users are concerned that increasing effort is needed to meet subsistence needs for late run sockeye salmon each year, fewer sockeye salmon may be reaching the Clark River spawning grounds, and overall productivity might be decreasing. Alaska Department of Fish and Game currently manages the late run sockeye salmon escapement to allow 50,000 through the Chignik River weir during August, but the number of sockeye salmon bound for Clark River is not known.

Objectives:

1) Estimate the number of Clark River sockeye salmon passing the Chignik River weir site.

2) Estimate the timing of the Clark River sockeye salmon run at the Chignik River weir site.

3) Estimate the number of sockeye salmon spawning in the Clark River.

Methods:

Radio tags would be attached to sockeye salmon migrating past the Chignik River weir site during August and September. Fifty tags would be deployed each month. To estimate the population size of the Clark River sockeye salmon run, tags would be recovered in the subsistence fishery near the mouth of Clark River and at Hatchery Beach. Run timing

information for Clark River sockeye salmon would also be estimated from information obtained from radio-tagged sockeye salmon. This information would be useful in evaluating potential effects of changing the way in which commercial and subsistence fisheries are managed. All radio tagging work would occur during one field season, which spans two fiscal years (August and September 2002 occur in fiscal year 2002; October and November 2002 occur in fiscal year 2003).

Foot surveys of the Clark River would be conducted every 14 days beginning in mid-September through mid-December in both 2002 and 2003. Local residents from the Villages of Chignik Lake, Chignik Lagoon, or Chignik would be hired by Bristol Bay Native Association and trained as surveyors to conduct the counts by King Salmon Fishery Research Office. The first sampling period of each year would include training for new fishery surveyors by staff from King Salmon Fishery Research Office. At least one additional oversight visit would occur during the season. It could take two days to completely survey all waters in Clark River accessible to adult salmon. Surveyors would wear polarized glasses to reduce water surface glare. Salmon would be identified to species and counted jointly by two surveyors as they walked upstream from the mouth of Clark River. When oxbows, side channels, and backwaters were encountered, one observer would count from a stationary position on the main channel while the other observer would count in the off-channel habitats. Counts would be recorded every 0.5 kilometers with locations determined by GPS received. Data would be recorded on preprinted water resistant forms. Data would include the survey section beginning and ending GPS coordinates, number of fish by species, time, water clarity, lighting, and wind generated surface turbulence. An area-under-the-curve method would be used to estimate the total escapement. Estimates would be calculated using stream life and observer efficiency values published in the literature, unless these values can be estimated using radio tagged sockeye salmon. Average stream life for sockeye salmon reported in the literature is about 13 days. A fall foot survey conducted by King Salmon Fishery Research Office staff in a stream about 65 miles northwest of Chignik estimated average observer efficiency to be 74%.

Deliverables/Products:

The King Salmon Fishery Resource Office would be responsible for quality assurance, generating the escapement estimates, and writing reports. Interim and final reports would be delivered to the Office of Subsistence Management, Fisheries Information Services Division. Results would be published in U.S. Fish and Wildlife Service Alaska Fisheries Data Series reports in both electronic (Adobe Acrobat) and paper formats, and the information would also be available for presentation to interested parties. Data would be archived per King Salmon Fishery Research Office standards.

Experience of Investigator(s):

Bristol Bay Native Association has extensive experience and commitment in identifying and promoting resource issues and priorities of villages within their region. Bristol Bay Native Association is fully capable of assuming administrative responsibilities for this project, and currently conducts and supports several projects in southwest Alaska.

King Salmon Fishery Resource Office has extensive experience in conducting fisheries studies in southwest Alaska. The staff at King Salmon Fishery Resource Office are fully qualified and prepared to conduct this project. All biologists have masters degrees with over 40 years combined professional experience.

Partnerships/Collaboration/Consultations:

Bristol Bay Native Association and King Salmon Fishery Resource Office would jointly conduct this project. Chignik Lake Village supports the project, and the use of local residents to serve as fishery technicians would be required to successfully conduct this project. This project would encourage local involvement in solving management problems for local salmon stocks.

Justification:

This study would estimate spawning escapement and run timing of late run sockeye salmon into Clark River based on radio telemetry and ground survey counts. The strategic importance of conducting this study rests upon a concern by local residents that it has become more difficult to meet subsistence needs and that the late-run sockeye salmon escapement goal used by Alaska Department of Fish and Game to manage this system should be increased. Alaska Department of Fish and Game operates a weir on Chignik River to estimate total spawning escapement and also flies aerial surveys to determine spawner distribution. Both projects terminate in early September, which is earlier than local residents think is needed to properly manage these resources for subsistence users. One way to obtain spawning escapement information later in the year would be to provide funding to Alaska Department of Fish and Game to extend weir and aerial survey operations for a few years to determine the magnitude of late season sockeye salmon run. This was suggested during the proposal review process, but does not appear to be a viable option at this time. Therefore, the investigators propose to obtain spawning escapement and timing estimates by conducting radio tagging mark-recapture experiments and area-under-the-curve calculations based on foot surveys.

A radio telemetry component was added to the investigation plan at the suggestion of the Technical Review Committee. While a detailed study design still needs to be developed, this work would add greatly to knowledge of the late run sockeye salmon run to Clark River. The greatest problem would be recapturing enough sockeye salmon with radio tags to generate a population estimate. While initial plans seek to accomplish this through the subsistence fishery at the mouth of Clark River and Hatchery Beach, consideration should also be given to designing a recapture operation within Clark River in case the subsistence fishery recovers too few tags.

The accuracy and precision of area-under-the- curve estimates depends upon the ability of ground survey crews to accurately count salmon (observer efficiency), the time salmon are available to be counted (stream life), and the frequency of surveys. Using observer efficiency and stream life values from the literature would result in unknown errors in escapement estimates, since studies have shown these values can vary greatly among systems and among years within the same system. It would be preferable to conduct experiments to estimate observer efficiency and residence time for this particular system. It might be possible to do this in conjunction

with the radio tagging component of this study. Based on past studies, a survey frequency of fourteen days would probably be too great, and should be reduced to seven days so that the shape and, therefore, the area-under-the-curve can be more accurately described. Also, ground surveys should be started early enough in the season so that the increasing abundance of spawners entering Clark River can be monitored and the area-under-the-curve can be delineated. If substantial numbers of salmon enter Clark River before ground surveys begin, it would not be possible to plot the ascending limb of the curve. Ground surveys would need to be started prior to 15 September, if salmon enter Clark River to spawn before this date. It might be useful to determine whether suitable sites for a counting tower or weir on Clark River exist, since these methods could be used for future assessment work.

Although review comments on the original proposal for this study indicated that collection of tissue samples for genetic work should not be included within the investigation plan, investigators are encouraged to contact the U.S. Fish and Wildlife Service Genetics Laboratory and the Alaska Department of Fish and Game Gene Conservation Laboratory to determine whether they have an interest in obtaining genetic samples from this salmon populations.

Consultations have occurred with local communities and residents. Partnership and capacity building would occur through the cooperation of U.S. Fish and Wildlife Service and Bristol Bay Native Association as co-investigators, mentoring and hiring local residents, and distribution of information obtained during this study through oral and written reports. The investigators have greatly reduced the amount of funding requested to accomplish this work, and U.S. Fish and Wildlife Service has included a significant in-kind contribution for project oversight, data analysis, and reporting.

Recommended For Funding

02-032

Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Lower Alaska Peninsula and Aleutian Islands

Investigator(s): Division of Subsistence, Alaska Department of Fish and Game; Anthropology Department, Idaho State University; Aleutian Pribilof Islands Association

FY2002 Budget: $ 91,387.00 **Total Budget (2 years):** $ 155,130.00

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type:** HM/TEK

Issues:

The problem of dwindling fisheries stocks in Western Alaska is an issue of community and cultural survival. Ongoing research in these villages has found that local people have felt disenfranchised from the fisheries management process. This project would implement recommendations from the "Statewide Subsistence Fisheries Harvest Monitoring Strategy" (Project FIS 00-017), and from a workshop involving fisheries managers, other agency personnel, and subsistence users of the study area communities (Project FIS 01-107). The proposed project would directly incorporate indigenous knowledge, local observations, long-term history, and direct community participation in the data collection process.

Objectives:

1) Estimate subsistence harvests of salmon and freshwater fish for the communities of Cold Bay, False Pass, King Cove, Nelson Lagoon, Sand Point, Adak, Akutan, Atka, Nikolski, and Unalaska.
2) Assess the relationship between commercial fishing and subsistence harvests, including estimates of fish removed from commercial catches for home use.
3) Document Traditional Ecological Knowledge of salmon and other fisheries through interviews.
4) Create a searchable database of Traditional Ecological Knowledge of the Alaska Peninsula and Aleutian Islands area fisheries.
5) Create a Geographic Information System of the history and modern characteristics of subsistence fisheries in the region that includes Traditional Ecological Knowledge.
6) Write a short summary of project findings for distribution to study community households.

7) Write a final report documenting methods and findings.

Methods:

Authorization to conduct this research would be sought in advance from tribal governments. An early step in the project would be community meetings, where research objectives would be discussed and issues identified. Local residents would be trained to distribute subsistence permits and harvest calendars and conduct post-season interviews for two harvest years. Project personnel and local assistants would conduct fisheries Traditional Ecological Knowledge interviews, and summarize data from existing tapes and archives. Post-fishing interviews would document removal of fish from commercial harvests for home use as well as rod and reel harvests.

Protocols for collecting Traditional Ecological Knowledge would be developed in consultation with community governments. Traditional Ecological Knowledge from previous interviews would be entered into a computerized, searchable database using the AskSam© program. Key respondents would be interviewed about use patterns, trends, and fish ecology. Maps would be used as prompts, and locations of key habitat areas and harvest areas would be mapped. Discussions among small groups of experts would be held. Transcriptions of individual and group interviews would be key-worded and entered into the database and distributed via CD-ROM. This project would integrate its data using a Geographic Information System.

Principal investigators would prepare a comprehensive final report describing the project background, methods, and findings. In addition, a short summary of project findings, written for a general audience, would be sent to households in all the study communities. A final set of community meetings would review study findings in the fall of 2003.

Deliverables/Products:

The harvest data would be included in the Subsistence Fisheries Database and the Annual Subsistence Fisheries report. The TEK would be entered into a database. The Geographic Information System database, on CD-ROM, would have maps describing the history of fisheries use and the nature of modern marine fisheries use. A short summary of the project findings would be sent to households in the study communities. A final report would discuss the project's results.

Experience of Investigator(s):

The Division of Subsistence, Alaska Department of Fish and Game, has conducted research and subsistence harvest assessments in the study area since the early 1980s. The Aleutian/Pribilof Islands Association has developed programs to increase Aleut tribal involvement in subsistence resource management issues, such as supporting advisory groups and initiating a Traditional Foods Protection Program. Herbert Maschner has conducted anthropological and archaeological fieldwork for the last seven years in the eastern Aleutian and Alaska Peninsula region. Katherine Reedy-Maschner has conducted ethnographic research in the communities of King Cove on the laska Peninsula, and False Pass on Unimak Island.

Partnerships/Collaboration/Consultations:

This project would be collaborative effort among Alaska Department of Fish and Game, Idaho State University, the Aleutian/Pribilof Islands Association, and various local communities. In each study community, local residents would be trained to conduct interviews and compile harvest data.

Justification:

This investigation plan melds proposals FIS 02-032 and FIS 02-026 into a single study to provide current trends and characteristics of subsistence fisheries for the communities of Sand Point, King Cove, False Pass, Akutan, Nelson Lagoon, Cold Bay, Unalaska, Nikolski, Atka, and Adak. Investigators would collect information on traditional ecological knowledge of salmon behavior, ecology, and distributions, and would document long-term changes in the ecology of western Alaska Peninsula salmon and the regional marine ecosystem. A reliable subsistence fishery harvest assessment program would be developed for salmon and other species, if the project partners concluded that such a program was necessary. An important product from this study would be a searchable database of Traditional Ecological Knowledge concerning the fisheries resources of the Alaska Peninsula and Aleutian Islands areas. The project is strategically important, based on input from the communities to be studied and the Kodiak/Aleutians Subsistence Regional Advisory Council. This project would also implement recommendations from a workshop conducted under study FIS 01-107. The budget seems to be reasonable for the proposed work, and the four principal investigators would bring a wealth of knowledge and experience to conduct this project. The investigators have excellent performance histories, with ample technical and administrative expertise to complete the project, and successful completion of many similar projects over the past ten or more years working in the Alaska Peninsula/ Aleutians region. Regional and local consultations have been carried out and more are planned as the project takes form. There is considerable local and regional support for this project. Capacity building would include hiring and training local residents to assist with the work, and making results readily available to agencies and communities in familiar formats.

Not Recommended For Funding

02-033

Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge, Kodiak Area

Investigator(s): Division of Subsistence, Alaska Department of Fish and Game; Kodiak Area Native Association

FY2002 Budget: $ 80,051.25 **Total Budget (2 years):** $ 156,271.00

Geographic Area: Bristol Bay, Alaska Peninsula, Kodiak **Information Type:** HM/TEK

Issues:

Comparisons of subsistence permit and survey data undertaken by the Subsistence Fisheries Harvest Assessment Working Group as part of Project FIS 00-017 suggested that the existing subsistence salmon harvest assessment program for the Kodiak Management Area underestimates harvests in the six small, remote communities. In May 2001, under Project FIS 01-107, a workshop took place in Kodiak involving Alaska Department of Fish and Game, the Alaska Inter-Tribal Council, the Kodiak Area Native Association, and tribal representatives to discuss the findings and develop specific recommendations. Workshop participants agreed there is a need to implement Subsistence Fisheries Harvest Assessment Working Group recommendations, to develop partnerships in the subsistence salmon harvest assessment program, and to determine harvest assessment programs are needed for other fisheries resources, such as Dolly Varden, steelhead, and rainbow trout. The participants also noted that Traditional Ecological Knowledge on fisheries should be made available to fisheries managers and subsistence users.

Objectives:

1) Obtain reliable estimates of subsistence harvests of salmon and other fish by gear type, location, and date for the communities of Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions.

2) Develop a searchable database of Traditional Ecological Knowledge about fisheries resources of the Kodiak Area in the AskSam© format.

3) Write a final report documenting methods and findings.

Methods:

This project would be a collaborative effort among the Division of Subsistence, Alaska Department of Fish and Game, the Kodiak Area Native Association, and local tribal governments. Authorization to conduct this research would be sought from each tribal government. Local residents would be hired as assistants and trained to participate in data collection. An early stage of the project would consist of holding community meetings to discuss and better focus research plans.

In six communities, local residents would collect subsistence permits and conduct post-season interviews for two harvest years, in coordination with the Alaska Department of Fish and Game vendor program already in place. An attempt would be made to interview all households on a voluntary basis. This would enable the investigators to fully document subsistence harvests. Interviews would identify sharing patterns, and document removal of fish from commercial harvests and use of rod and reel to meet subsistence needs. Post-season interviews would be conducted to collect harvest data for other fisheries resources used in the communities. Information would be compiled and included within annual area management reports for the Kodiak Management Area and the Alaska Subsistence Fisheries Annual Reports. These data would also be included in the Alaska Subsistence Fisheries Database.

Investigators would summarize existing Traditional Ecological Knowledge information from previous Alaska Department of Fish and Game interviews. These materials would be entered into a computerized, searchable database using the AskSam© program. Investigators would conduct key respondent interviews about use patterns, trends, and fish ecology. Interviewers would use maps, tape recorders, and both formal and informal methods. A second procedure would involve discussions about Traditional Ecological Knowledge among small groups of experts in each community. Transcriptions from individual and group interviews would be key-worded and entered into the AskSam© database. A final set of community meetings would be held in the fall of 2003 to review study findings and demonstrate the AskSam© database of Traditional Ecological Knowledge for Kodiak Management Area communities.

Deliverables/Products:

Two years of harvest data would be included in the Alaska Subsistence Fisheries Database, and would be reported in the Annual Management Report for the Kodiak Area and the Annual Alaska Subsistence Fisheries report. Traditional Ecological Knowledge information would be entered into a searchable database using the AskSam© format. A final report documenting project procedures and results would also be produced.

Experience of Investigator(s):

The Division of Subsistence, Alaska Department of Fish and Game, has conducted research and subsistence harvest assessments in the Kodiak area since 1983. Kodiak Area Native Association has collaborated with the Division of Subsistence in two of these harvest assessment projects.

The Division of Subsistence maintains the Subsistence Fisheries Database and prepares the annual Subsistence Fisheries Report.

Partnerships/Collaboration/Consultations:

This project would be collaboration among Alaska Department of Fish and Game, Kodiak Area Native Association, and local communities. Local residents would be trained to conduct interviews and compile harvest data. Project findings would be reviewed by, and shared with, the local communities included in the study.

Justification:

The study would provide reliable estimates of subsistence harvests of salmon and other fish by gear type, location, and date for six Kodiak communities. It would produce a searchable database of Traditional Ecological Knowledge information about Kodiak area fisheries resources. This would be a follow-up to study FIS 01-107 workshop recommendations. The proposed work would directly addresses concerns voiced by local subsistence users and the Regional Advisory Council for this area. The study approach is sound, and the budget is reasonable for the proposed work. The investigators have the technical and administrative expertise to accomplish project objectives. Few Fishery Resource Monitoring Program harvest monitoring or Traditional Ecological Knowledge studies have been conducted within the Kodiak-Aleutians area. This study would strengthen the partnership between Alaska Department of Fish and Game and Kodiak Area Native Association, and would build capacity within local communities through training and employment of residents. Results would be readily available in familiar formats. Unfortunately, 2002 funding requests for harvest monitoring and Traditional Ecological Knowledge studies in the Bristol Bay-Alaska Peninsula/Kodiak-Aleutians region greatly exceeded available resources. As a result, this worthy study is not being recommended for funding this year.

Not Recommended For Funding

02-034

Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species

Investigator(s): Division of Subsistence, Alaska Department of Fish and Game; Bristol Bay Native Association

FY2002 Budget: $ 30,963.00

Total Budget (2 years): $ 74,249.00

Geographic Area:
Bristol Bay, Alaska Peninsula, Kodiak

Information Type: HM/TEK

Issues:

There is a lack of recent comprehensive information on subsistence harvests of resident fish in the Kvichak River watershed, which includes the Alagnak (Branch) River, Iliamna Lake, and Lake Clark. This issue is accentuated by potential changes in the subsistence fishery due to a decline in sockeye salmon runs, and the lack of accessible Traditional Ecological Knowledge information on use patterns, ecology, and population trends for other fishes.

Objectives:

1) Estimate subsistence harvests of Dolly Varden, whitefish, northern pike, grayling, lake trout, rainbow trout, blackfish, burbot, smelt, and longnose sucker by communities within the Kvichak River watershed, including Levelock, Igiugig, Kokhanok, Pedro Bay, Iliamna, Newhalen, Nondalton, and Port Alsworth.

2) Describe subsistence use patterns, including gear type, timing and location of harvests, preservation and preparation methods, distribution and exchange, for each fish species or species group.

3) Describe trends in harvests and use patterns, fish populations, and fish ecology

4) Compile Traditional Ecological Knowledge information for these communities, collected during this project and past projects, in a searchable database (AskSam© format).

5) Evaluate the need for more long-term subsistence harvest monitoring work.

6) Produce a final report documenting project methods and findings.

Methods:

Procedures would be consistent with recommendations of the Subsistence Fisheries Harvest Assessment Working Group. The first step would be to obtain approval from all communities to be including within the study. Community meetings would then be held to review, refine, and focus activities. Local residents would be trained to collect harvest data using calendars and interviews. All households would be asked to voluntarily record harvests of all fish species or species groups on calendars that would be collected four times during the period April 1, 2002 to March 31, 2003. When collecting calendars, local researchers would supplement calendar data with short interviews. In April 2003, all households would be interviewed, including those that did not keep calendars. All information would be kept anonymous. Community harvests would be summarized, including compilations by gear type and timing. Findings would be reviewed during community meetings. Information collected would be summarized in a final report and included in the Alaska Subsistence Fisheries Database, the Alaska Subsistence Fisheries Annual Report, and the Community Profile Database. The final report would also contain recommendations for long-term monitoring of subsistence harvests of fishes other than salmon.

Alaska Department of Fish and Game and Bristol Bay Native Association staff would conduct two to three key respondent interviews in each village to collect information about use patterns, trends, fish ecology, and fish populations. The local research assistants would help set up and conduct these interviews. Round-table discussions among key respondents would also take place. Protocols for collecting Traditional Ecological Knowledge would be developed in consultation with community governments. Transcriptions or detailed notes from each interview would be key-worded and entered into an AskSam© database. Summaries of findings would be included in the final report. Alaska Department of Fish and Game staff would also complete an inventory of field notes, trip reports, audiotapes, and other records for information regarding Traditional Ecological Knowledge of fish resources used by the study communities. The AskSam© database developed by the study would be demonstrated at a final set of community meetings

Deliverables/Products:

Bristol Bay Native Association and Alaska Department of Fish and Game would partner to prepare a final report that would include discussions, analyses, and summaries of qualitative and quantitative data collected during the research phase of this study. Harvest data would be summarized in the Community Profile Database, the Alaska Subsistence Fisheries Database, and the Alaska Subsistence Fisheries Annual Report for 2002. Key respondent interviews would be summarized in a database using the AskSam© format, and distributed on CD-ROM.

Experience of Investigator(s):

The Division of Subsistence, Alaska Department of Fish and Game, has conducted socio-cultural research and subsistence harvest assessments in the Bristol Bay area since the late 1970s, and has produced a series of technical papers about subsistence uses in Kvichak/Iliamna Lake/Lake Clark communities. The Natural Resource Department, Bristol Bay Native Association, has collaborated with the Division of Subsistence in several highly successful harvest assessment

projects, including studies on freshwater fish in the Togiak National Wildlife Refuge and large land mammals on the northern Alaska Peninsula.

Partnerships/Collaboration/Consultations:

The project would be a partnership between Alaska Department of Fish and Game and Bristol Bay Native Association. Workshops would be held in communities included in the study to help define research questions, review data, develop conclusions and recommendations, demonstrate the databases, and discuss applications of study findings. Residents of study communities would be hired and trained to collect harvest information and assist in conducting key respondent interviews.

Justification:

This investigation plan is a resubmission of study FIS 01-018, which was not funded last year. This study would provide estimates of subsistence harvests of nine subsistence fish species or species groups, other than salmon, for the Kvichak River watershed in Bristol Bay. It would also look at potential changes in the subsistence fishery with respect to changes in sockeye salmon runs; describe subsistence use patterns for each fish species or group; gather Traditional Ecological Knowledge about fish harvests, uses and fish populations; and evaluate the need for more long-term harvest monitoring. The investigators have a long-term record of success in management of subsistence fish and wildlife resources in the Bristol Bay region, and have worked for and with a variety of agencies and entities. The investigators also have excellent reputations for knowing what issues are important to local subsistence users and the Regional Advisory Council, for working with agencies and entities on challenging subsistence issues, and for bringing projects with diverse multiple partners to closure. Investigators have the technical and administrative expertise to complete the proposed work. Study objectives are clearly stated, and are achievable within the proposed budget. The project would be co-managed, and would include hiring and training of local residents to conduct interviews and collect harvest information. Unfortunately, 2002 funding requests for harvest monitoring and Traditional Ecological Knowledge studies in the Bristol Bay-Alaska Peninsula/Kodiak-Aleutians region greatly exceeded available resources. As a result, this worthy project is not being recommended for funding this year.

INTER-REGIONAL

OVERVIEW

Issues and Information Needs

- A number of Regional Advisory Councils have identified issues and information needs that apply to more than one region or have statewide application. There is continued interest in:
    - Organization of existing, as well as new, fisheries information in a way that can be easily located and obtained by tribal, state and federal interests;
    - Development of consistent methods for subsistence harvest monitoring and conducting Traditional Ecological Knowledge studies;
    - Improvement of methods used to set salmon spawning goals and sustain subsistence harvests;
    - Expanded communication and coordination among regions to better achieve resource stewardship and more effectively deploy program funds through coordinated planning.
- The Federal Subsistence Board decided it would not fund studies dealing with hatchery propagation, restoration, enhancement, and supplementation; habitat protection, restoration, and enhancement; or contaminant assessment, evaluation, and monitoring.
- Regulatory issues can also be used to identity issues and information needs. Two statewide regulatory proposals were submitted in 2002. One seeks changes to existing subsistence fisheries practices, while the other seeks to establish a new federal subsistence permit for marine fishes.

Studies Forwarded for Investigation Plans

- The Technical Review Committee advanced a total of five studies for Investigation Plan development. A total of $178.1 thousand would be needed to fund these studies in fiscal year 2002, while only $105.0 thousand is available **(Tables 1, 2, and 3).**
- In making funding recommendations, the Technical Review Committee considered strategic needs for the information, technical merits of the study, performance ability of investigators, and contributions to local partnership and capacity building.

Table 1. Proposed recommendation of 2002 Inter-Regional stock status and trends investigation plans for funding consideration. Proposed recommendations are shown with bold type, and noted with "Yes" in the "Recommendation" column.

			Requested Budget		
FIS #	Title	Recommendation	2002	2003	2004
02-025	**Development of General Method for Calculation of Sustainable Subsistence Harvest**	**Yes**	**$45.7**	**$74.7**	**$48.4**
02-069	**Develop Shared AYK Fishery Database**	**Yes** *a*	**$31.9**		
02-071	Strategy for Assessing Release Mortality of Sport-Caught Fish in Western and Interior Alaska	No	$59.0	$187.2	
	GRAND TOTALS		$136.6	$261.9	$48.4
	TARGET BUDGET LEVELS		$70.0	$159.7	$159.7
	PROPOSED SELECTIONS		**$77.6**	**$74.7**	**$48.4**

a This proposal reached the investigation plan stage in 2001 as study 01-016. Modifications in 2002 greatly lowered cost.

Table 2. Proposed recommendation of FY 200 Inter-Regional harvest monitoring and Traditional Ecological Knowledge investigation plans for funding consideration. Proposed recommendations are shown with bold type, and noted with "Yes" in the "Recommendation" column.

			Requested Budget		
FIS #	Title	Recommendation	2002	2003	2004
02-043	**Alaska Subsistence Fisheries Database GIS Integration**	**Yes**	**$27.5**		
02-047	Alaska Subsistence Salmon Harvest Timing (Phase 1): Bristol Bay, Chignik District, Cook Inlet, and Kuskokwim Drainage	No	$14.0	$14.5	
	GRAND TOTALS		$41.5	$14.5	$0.0
	TARGET BUDGET LEVELS		$35.0	$0.7	$79.9
	PROPOSED SELECTIONS		**$27.5**	**$0.0**	**$0.0**

Table 3.

FY 2002 Inter Regional Projects

Region 7. Inter regional

Type A . Stock Status & Trends

Doc #	Agency/Org	Title	NGO $	Fed$	State $	Total $
02-025	UAF, UW	Development of general method for calculation of sustainable subsistence harvest	$45,741.00	$0.00	$0.00	$45,741.00
02-069	ADFG-CFD	Develop Shared Fishery Database	$0.00	$0.00	$31,900.00	$31,900.00
02-071	ADFG-SFD, USFS	Assessment of Scientific Studies Relating to the Practice of Catch-and-Release Fishing in Western and Interior Alaska	$0.00	$0.00	$59,000.00	$59,000.00
Total			$45,741.00	$0.00	$90,900.00	$136,641.00

Type B. Harvest Monitoring/TEK

Doc #	Agency/Org	Title	NGO $	Fed$	State $	Total $
02-043	ADFG-SD	Alaska Subsistence Fisheries Database GIS Integration	$0.00	$0.00	$27,525.00	$27,525.00
02-047	ADFG	Alaska Subsistence Salmon Harvest Timing (Phase I): Bristol Bay, Chignik District, Cook Inlet, and Kuskokwim Drainage	$0.00	$0.00	$13,991.29	$13,991.29
Total			$0.00	$0.00	$41,516.29	$41,516.29
Grand Total			$45,741.00	$0.00	$132,416.29	$178,157.29

Selection Process—Stock Status and Trends Studies

- Three studies were advanced for Investigation Plan development in the Stock Status and Trends category **(Table 1)**. Each of these studies addresses a different general issue: Subsistence Fishery Management Practices, Fishery Information Access, and Catch-And-Release Fish Mortality.

- Funding requested for the three stock status and trends studies advanced for investigation plans totaled approximately $136.6 thousand for fiscal year 2002, while a total of $70.0 thousand is available.

- The Technical Review Committee recommended funding for two studies in fiscal year 2002 **(Table 1)**. Total cost for these projects in fiscal year 2002 is anticipated to be about $77.6 thousand, which is about 10% more than the target budget level.

- Although the Technical Review Committee had asked for a proposal to form a working group to examine catch-and-release mortality of fishes, they did not recommend the submitted study be funded. This decision was based on budget limitations and the greater perceived strategic importance of two other studies. One would seek to change existing methods used to set salmon spawning goals and sustain subsistence harvests, while the other would complete database work begun in fiscal year 2000 for the Arctic, Yukon, and Kuskokwim regions.

Selection Process – Harvest Monitoring and Traditional Ecological Knowledge Studies

- Two studies were advanced for Investigation Plan development in the Harvest Monitoring and Traditional Ecological Knowledge categories (**Table 2**). Both of these address the issue of Harvest Information Access.

- The Technical Review Committee recommended funding for one study in fiscal year 2002 **(Table 2)**. Total cost of this project in fiscal year 2002 is anticipated to be about $27.5 thousand, which is about 21% less than the target budget level.

- Both studies had technical merit, would be done by experienced investigators, and would contribute to capacity building. However, the recommended study, which would integrate two existing statewide databases into a single Geographic Information System to enhance availability and use, was thought to have greater strategic importance than the other study, which would make subsistence harvest timing information easier to access and use.

Funding Recommendation Summary

- Three studies, two Stock Status and Trends studies and one Harvest Monitoring/Traditional Ecological Knowledge study, were recommended for funding with a cost of $104.0 thousand in fiscal year 2002 **(Tables 1, 2, and 3).**

- All funding for these three studies would go to non-government organizations and state agencies **(Figure 1).**

- About 11% of the funds for these three studies ($12.0 thousand) would be used for local hire, while investigators would contribute $28.0 thousand in matching funds **(Table 4).•**

Investigation plans not selected for funding this year will not automatically become eligible for funding consideration next fiscal year. Investigators need to submit new proposals requests to fund this work in fiscal year 2003.

Study Recommendations, Descriptions, and Justifications

- Additional details about each project can be found in the sections that follow. For each project, we have included the Technical Review Committee recommendation, a project description, and the technical justification for the recommendation.

- Study information is organized into two sections. The first contains Stock Status and Trends studies information, while the second contains Harvest Monitoring and Traditional Ecological Knowledge studies information. Within each section, studies are organized by their assigned numbers, in increasing order.

Figure 1. 2002 Inter–regional funding distribution

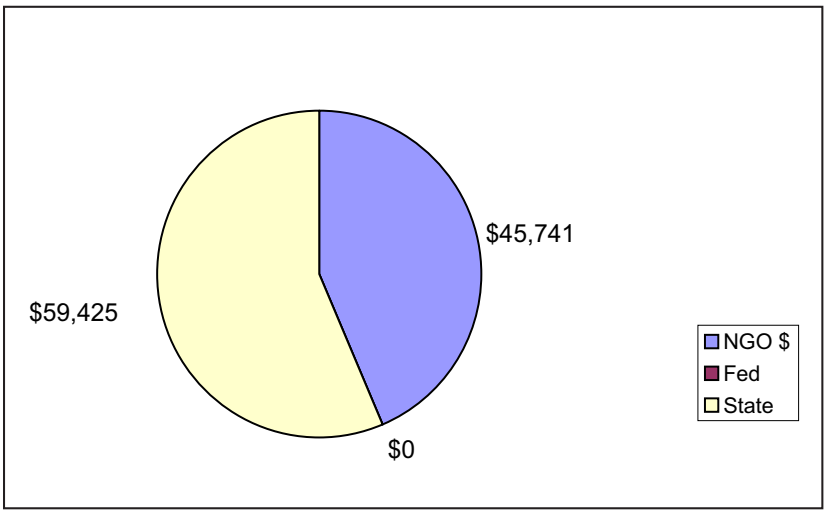


Table 4.

2002 Local Hire and Matched Funds Report Inter Regional

Region **7. Inter regional**

Type **A . Stock Status & Trends**

Doc #	Agency/Org	Title	Local Hire $	Matched $
02-025	UAF, UW	Development of general method for calculation of sustainable subsistence harvest	$0.00	$0.00
02-069	ADFG-CFD	Develop Shared Fishery Database	$12,000.00	$28,000.00
02-071	ADFG-SFD, USFS	Assessment of Scientific Studies Relating to the Practice of Catch-and-Release Fishing in Western and Interior Alaska	$0.00	$0.00
Total			$12,000.00	$28,000.00

Type **B. Harvest Monitoring/TEK**

Doc #	Agency/Org	Title	Local Hire $	Matched $
02-043	ADFG-SD	Alaska Subsistence Fisheries Database GIS Integration	$0.00	$0.00
02-047	ADFG	Alaska Subsistence Salmon Harvest Timing (Phase I): Bristol Bay, Chignik District, Cook Inlet, and Kuskokwim Drainage	$0.00	$6,000.00
Total			$0.00	$6,000.00
Grand Total			$12,000.00	$34,000.00

Recommended For Funding

02-025

Development of General Method for Calculation of Sustainable Subsistence Harvest

Investigator(s): University of Washington, School of Aquatic and Fishery Sciences; University of Alaska Fairbanks, Juneau Center, School of Fisheries and Ocean Sciences; Alaska Department of Fish and Game, Division of Commercial Fisheries

FY2002 Budget: $45,741.00

Total Budget (3 years): $168,910.00

Geographic Area: Inter-Regional

Information Type: Stock Status and Trends

Issues:

A key question in management of all subsistence fisheries in Alaska is determining the level of sustainable subsistence harvesting. This project will develop a new paradigm and algorithm for calculation of sustainable levels of subsistence harvesting in the form of a protocol and computer program for analyzing available data on a salmon stock and evaluating the long term consequences of different harvest policies.

Objectives:

1) Develop a format for definition of subsistence fishery management objectives.

2) Use defined objectives to analyze utility functions for different levels of catch and different inter-annual variation in catches for defined subsistence user groups.

3) Develop computer software to evaluate alternative management policies.

4) Use a decision-analysis framework to analyze objectives, including evaluation of uncertainty.

5) Develop a protocol for using the computer software, consisting of a users manual, worked examples, and a web-based power-point demonstration of how to use the software and interpret results.

Methods:

The three major innovative components of the protocol to be developed would be (1) describing salmon population dynamics using ecosystem oriented models that move beyond fitting stock and recruitment data to Ricker models, (2) evaluating harvest policies that maximize objectives other than long-term maximum yield, and (3) using formal methods of statistical decision-analysis to incorporate uncertainty into the evaluation of consequences. Salmon population models would include components to simulate (1) dynamics of populations at low abundance densities, (2) errors in estimating spawning stock and recruitment, (3) effects of marine derived nutrients in freshwater systems on salmon production, (4) effects of sub-stock structure within the "stock" being managed, (5) forms of compensatory mortality other than Ricker model type, (6) implementation error associated with estimating run size and catch in a year, and (7) effects of oceanic regime shifts on salmon production. The computer program developed would be written using AD Model Builder software (Otter Software, Nanaimo B.C.), and the user interface would be programmed in EXCEL to provide a user-friendly format for data entry and output. Workshops and meetings would be scheduled during the project to gather and disseminate information among agencies and organizations.

Deliverables/Products:

The final product of this project would be a computer software package and protocol that should greatly enhance the ability of fisheries management agencies and organizations to evaluate alternative subsistence harvesting regimes. Reports would also be written at the end of each work year to describe methods, data, results and accomplishments, as well as any proposed changes in design or methods. These reports would be produced in both paper and electronic format, and provided to the Office of Subsistence Management as well as the Alaska Resources Library Information System (ARLIS).

Experience of Investigator(s):

The investigators from University of Washington and University of Alaska have extensive experience in all aspects of this project and have been leaders in salmon research, particularly in the area of quantitative stock assessment. They have worked closely with management agencies and various user groups to evaluate salmon spawning goals and management policies, and have held workshops on various fishery topics for both professional and lay audiences.

The investigator from Alaska Department of Fish and Game has worked extensively on applied salmon research and management topics, including scientific evaluation of harvest policies.

Partnerships/Collaboration/Consultation:

While the software developed by this project would primarily be used for analyses conducted by professional biologists working for agencies or regional groups, subsistence user groups would have a key role in developing subsistence fishery management objectives and evaluating resulting products. Consultations have already taken place with Bristol Bay Science Center, Aleutians

East Borough, Chignik Regional Aquaculture Association, and Alaska Department of Fish and Game. Further consultations would occur with other regional organizations and federal fishery management agencies.

Justification:

The overall concept for this work has merit, and new methods for establishing salmon escapement goals and subsistence harvest strategies would benefit both management agencies and subsistence users. The investigators propose to develop methods and software to estimate sustainable subsistence salmon harvests. Methods currently being used are based on achieving maximum sustained yield, which is not a suitable management goal for management of subsistence fisheries, and on empirical models, which do not incorporate uncertainty. The technical approach proposed to develop this methodology is excellent. Two modifications are needed improve the usefulness of this work to federal subsistence fishery program. First, the focus of proposed efforts was directed primarily at sockeye salmon and state-managed subsistence fisheries. This project needs to be broadened to include other salmon species and to focus on federally managed, rather than state managed, subsistence fisheries. The most difficult federal subsistence management issues currently exist for chinook and chum salmon runs to the Yukon and Kuskokwim Rivers. Therefore, at least one of these species in one of these systems should be used as a test case for model development and evaluation. Second, a staff member from a federal fishery management agency needs to be added as a partner to serve a function analogous to that served by the state management agency partner. This would help ensure acceptance of this tool by both state and federal fishery management agencies.

The investigators and their organizations or agencies have both the administrative and technical expertise to conduct this work. At least one of the investigators also has a great deal of experience conducting effective workshops with both professional fishery biologists and resource users on various stock assessment procedures and fisheries problems.

Partnership and capacity building aspects of this proposed study, while improved from that described in the original proposal, still require further refinement and development. The Investigators have selected an issue with widespread interest among federal subsistence users and management agencies, but need to ensure that meaningful participation and information exchange occurs with local communities and residents, and that local support exists for the proposed study. No letters of support for this work were received from local organizations, and consultations with these organizations have been too limited. While technical reviewers and fishery managers generally see a benefit from conducting the proposed work, Regional Advisory Council members and federal subsistence users may not understand or agree with this approach. Therefore, investigators may need to put more effort into explaining the need for this work and its products to this audience.

Recommended For Funding

02-069

Develop Shared Fishery Database

Investigator(s): Division of Commercial Fisheries, Alaska Department of Fish and Game

FY2002 Budget: $ 31,900.00

Total Budget (1 year): $ 31,900.00

Geographic Area: Inter-Regional

Information Type: SST

Issues:

This is a continuation and next phase of a database inventory, planning and development project funded in fiscal year 2000 (*Shared Information for Fishery Management in AYK, FIS00-016*). A data management system for management of fisheries in the Arctic/Kotzebue/Norton Sound, Yukon River, and Kuskokwim River federal subsistence fisheries management regions does not currently exist. The goal of this project is to develop a comprehensive data management system for use by all governmental and public entities involved in managing these fisheries. Ready access to critical fisheries information would be beneficial to both management agencies and subsistence users.

Objectives:

1) Aggregate diverse sources of fishery data.

2) Error-check and correct historic data as necessary.

3) Begin standardizing data formats, where necessary, for inclusion into a centralized database.

4) Develop intermediate data entry, editing and reporting programs for area staff so that more thorough error checking, editing and a standard format of data can begin as soon as possible.

Methods:

This would be the second year of a project first funded in fiscal year 2000. Activities for fiscal year 2002 would focus on completing any remaining data inventory, editing, entry, and documentation; and to correct or reconfigure important data sources that are currently in a format that would be especially difficult to incorporate into a data management system. The major information sources needed for an information management system were identified as subsistence and commercial harvests, spawning escapements, and ancillary biological data such as age, sex and size. Each of the specific objectives listed above would be completed for each of these data

sources. Alaska Department of Fish and Game staff in area offices would transfer biological and recent spawning escapement data to a centralized location, Division of Commercial Fisheries Region III Biometrics Section in Anchorage, so that the work can be accomplished. Area office staff would work closely with Biometrics Section staff in editing and correcting historic data. Several critical data sources have already been identified as needing immediate attention to prevent data loss. Editing and reporting programs would also need to be developed for some data sources. Additional problems or needs would be identified and, if possible, corrected during this next year of the project.

Deliverables/Products:

A project report detailing accomplishments; descriptions of which data have been aggregated, edited, and reformatted; and examples or descriptions of intermediate data entry forms and reports would be submitted by October 31, 2002. Also available would be an updated inventory of data sources developed during 2000 activities, including documentation on data content, storage format, any particular problems, and a primary contact; and updated examples of management reports, data access, data linkage types, and data summaries required by parties involved in fishery management.

Experience of Investigator(s):

The principal investigator has over twenty years of experience in the Arctic-Yukon-K Region as both a fisheries biologist and biometrician for Alaska Department of Fish and Game. She has extensive knowledge of how fishery data is collected, stored, compiled and interpreted to support resource management needs. She is familiar with modern database software, uses database software on a regular basis, and has developed and maintained several smaller-scale data management systems. She also worked for several years as the primary region contact and contributor on a closely related, federally funded project to aggregate salmon escapement data into a central Geographic Information System. While not assigned to this project, the Division of Commercial Fisheries has staff in their Headquarters office that could provide assistance to the principal investigator. These staff members develop and maintain several large-scale client-server databases, such as the Mariner data management system used in Bristol Bay and the Alex/IFDB data management system used in Southeast.

Partnerships/Collaboration/Consultations:

Efforts would be made to hire local residents as technicians or fisheries biologists to assist Alaska Department of Fish and Game area staff and the principal investigator with data editing. Training in the use of computer software would be provided.

Fisheries management activities within the Arctic-Y-Kuskokwim region has more and more become a cooperative effort among the Alaska Department of Fish and Game, local organizations such as the Kuskokwim River Salmon Management Working Group and the Yukon River Drainage Fisheries Association, and federal agencies. Activities have included fisheries management and restoration planning, data collection and information sharing, and pre-season,

in-season, and post-season consultations. These efforts have been developing for over a decade, have increased the participation of rural residents in the management process, and have improved the management of the region's fisheries.

Justification:

This work was started in 2000 as study FIS 00-016, which has the ultimate goal of developing a shared database of fishery information for the Arctic-Yukon-Kuskokwim regions. The original proposal requested multiple years of funding to complete the work, but only a single year of activity was approved by the Federal Subsistence Board in 2000 to complete two objectives: 1) comprehensive inventory of available data, and 2) determination of information needs of government agencies and non-government organizations involved in cooperative fishery management. This work has generally proceeded on schedule, and both 2000 project objectives will be successfully completed. A detailed progress report was submitted June 15, 2001, a short performance report is due September 3, 2001, and the final report is due December 30, 2001. A 2001 proposal to continue these efforts was requested by the Technical Review Committee. It was advanced to the investigation plan stage as study FIS 01-016, but did not receive further consideration because the investigator did not require funding until 2002. Activities proposed for 2002 consist of 1) aggregating the diverse sources of fishery data identified in 2000, 2) checking and correcting errors, 3) standardizing data formats to facilitate inclusion into a centralized database, and 4) developing intermediate data entry, editing and reporting programs to ensure more thorough error checking, editing, and standard formatting during future data collection activities. The strategic importance of making fisheries information easily accessible through a shared database is quite high. While the final scope and design of the database will be influenced by results and recommendations of the Database Working Group funded in 2001 (study FIS 01-154), proposed objectives for the 2002 study are general enough to be successfully achieved without waiting for final recommendations and protocols from the Working Group. The investigator has incorporated proposal review recommendations into the investigation plan, and has considerably reduced the amount of funding requested for this study. Full-time personnel costs would be covered by the State as in-kind matching funds. Efforts would be made to hire local residents to assist in data entry, editing, and formatting. This would help foster local interest and ownership in the final product and strengthen partnership and capacity building aspects of this work.

Not Recommended For Funding

02-071

Assessment of Scientific Studies Relating to the Practice of Catch-and-Release Fishing in Western and Interior Alaska

Investigator(s): Sport Fish Division, Alaska Department of Fish and Game

FY2002 Budget: $ 59,000.00

Total Budget (2 years): $ 246,200.00

Geographic Area: Inter-Regional

Information Type: SST

Issues:

Contemporary sport anglers consider catch-and-release a legitimate, responsible, and often desirable fishing practice. However, subsistence users in western and interior rural Alaska do not release their catches and question whether there is sufficient knowledge, applicable to Alaska, to determine the fate of released fish and to assess the potential effects of catch-and-release sport fisheries on subsistence fishing opportunity. A comprehensive summary of scientific studies of catch-and-release is not available to fishery managers and resource users, nor has there been any assessment or review of potential applications of catch-and-release practices to western and interior Alaskan fisheries. This project would coalesce and review existing information regarding effects of catch-and-release, and then convene a working group composed of subsistence users, sport users, and fishery managers to examine this information. The working group would develop recommendations for a comprehensive strategy regarding assessment of catch-and-release effects on subsistence fishery resources.

Objectives:

1) Coalesce available scientific studies concerning effects of catch-and-release on fish and assess their reliability and applicability to Alaskan fisheries.

2) Produce a catch-and-release database of these studies on the Internet, including references, comments on reliability and applicability to Alaskan fisheries, and links to each study.

3) Make specific recommendations to state and federal agencies for interpreting and using existing information, for establishing protocols for conducting studies, and for conducting any needed studies.

Methods:

During the first year of the project, Division of Sport Fish, Alaska Department of Fish and Game, staff would coalesce available information regarding effects of catch-and-release on fishes. A comprehensive literature search would be conducted of all scientific journals, and additional searches would be made for state, federal, and tribal reports, academic theses, and other sources of information. Most searches would be done through the Alaska Resources Library and Information Services. All studies found would be reviewed for both scientific reliability and applicability to Alaskan fisheries. For each study reviewed, an abstract or summary, complete reference, and review of reliability and applicability would be made available on the Division of Sport Internet site. Full-text, downloadable files of each study report would also be made available, if permission could be obtained.

During the second year of the project, a working group, composed of subsistence users, sport users, and fishery managers, would be convened to examine compiled catch-and-release study information. Group members would include fishery biologists and social scientists from state and federal agencies, as well as representatives of user groups. The group would review compiled catch-and-release information, make recommendations for interpreting and using the information, inventory catch-and-release fisheries within the area covered by the project, and identify any issues of concern. The group would also make recommendations on the needed for any further studies of catch-and-release effects, including design and conduct any needed studies, and how to use this information in management of fisheries resources. All this would be used to design a comprehensive strategy to further assess catch-and-release issues in western and interior Alaska.

Deliverables/Products:

Two main products would be available from this work. The first would be a centralized database, accessible from the Division of Sport Fish Internet site, of catch-and-release study information, in the form of full-text downloadable files and annotations concerning reliability and applicability. The second would be a written report that could serve as a comprehensive strategy guide for assessing catch-and-release issues in western and interior Alaska. The report would include a review of available catch-and-release information, recommendations for interpreting and using this information, an inventory of catch-and-release fisheries within the project area, identification of issues of concern; recommendations for further studies of catch-and-release effects, protocols on design and conduct of any needed studies, and suggestions on use of this information managing fisheries resources.

Experience of Investigator(s):

The Alaska Department of Fish and Game, Division of Sport Fish, has a long history of high quality fisheries data collection and analysis activities. The principal investigator has a strong technical fisheries background that has included the design and conduct of catch-and-release mortality studies. Other staff biologists assisting with this work also have many years of experience conducting and evaluating catch-and-release studies as well as experience in coalescing data from diverse sources. In addition, the investigator will have access to biometric

support as well as computer specialists with expertise in creating and maintaining Internet sites. The Alaska Department of Fish and Game is a founding member of Alaska Resources Library and Information Services and has a full-time librarian available to assist with searches and obtaining copies of catch-and-release studies.

Partnerships/Collaboration/Consultations:

Development of a comprehensive database on catch-and-release effects on fishes would provide a valuable tool for future capacity building between fishery management agencies and affected user groups. Formation of a working group composed of subsistence users, sport users, and fishery managers to examine this information and develop recommendations would build partnerships and develop the capacity of subsistence users to actively participate in the development of resource management strategies.

Justification:

The Technical Review Committee requested this proposal due to broad concern with effects of catch-and-release sport fishing within many arctic, western, and interior Alaska rural communities. Regional Councils for these geographic areas have identified concern with delayed mortality resulting from catch and release fishing as an issue, and have request specific studies addressing the following issues: 1) long-term mortality of released angler-caught sheefish, char, and other freshwater species, including fish that are caught multiple times; 2) delayed mortality of angler caught and released northern pike from the Innoko River and elsewhere; and 3) effects of catch and release fishing on salmon and trout behavior, mortality, and spawning success. The Technical Review Committee suggested that a working group be formed to address the general issue of catch-and-release hooking mortality by conducting an inventory of catch and release studies done within this area, examining the applicability of existing data on catch-and-release mortality as practiced within this area, and developing recommendations for any additional studies on catch-and-release mortality. The Office of Subsistence Management solicited this proposal as a vehicle to develop such a working group. Technical Review Committee requested several modifications to the original proposal and resulting investigation plan, and the investigator incorporated most of these into the last version submitted. The cost of this effort has been substantially reduced from the original request, and does not seem unreasonable when compared to the cost of past working group funded under this program. Partnership and capacity building would occur through dissemination of information of catch-and-release fish mortality studies, through participation of subsistence users in the working group, and through review of working group products by Regional Advisory Councils, rural residents, and local and regional organizations. Some reviewers still have concerns about using Subsistence Fishery Resource Monitoring Program funding to conduct work on effects of catch-and-release sport fishing on fishes. Also, while several Regional Advisory Councils and local communities have identified catch-and-release fishing effects on local fishery resources as an issue of concern, no letters of support for this study have been received. Therefore, the strategic importance of this particular study to subsistence users may not be as great as was originally anticipated by the Technical Review Committee.

Recommended For Funding

02-043

Alaska Subsistence Fisheries Database GIS Integration

Investigator(s): Division of Subsistence, Alaska Department of Fish and Game

FY2002 Budget: $ 27,525.00

Total Budget (1 year): $ 27,525.00

Geographic Area: Inter-Regional

Information Type: HM/TEK

Issues:

Public access to information on subsistence fisheries is an important part of the federal management and regulatory process. There is a need to make information on subsistence harvests more easily accessible in a format that is easy to use and understand. Since fishery resource use is highly regionalized within the state, a Geographic Information System would allow users to better visualize and understand where and how different communities use various fish species throughout the year. Being able to use maps to illustrate this information would be more effective and intuitive than depictions of these data using tables and charts.

Objectives:

1) Link subsistence fisheries information contained within the Alaska Subsistence Fishery Database maintained by Division of Subsistence, Alaska Department of Fish and Game to the Geographic Information System of anadromous stream information maintained by Division of Habitat, Alaska Department of Fish and Game.

2) Create search and query options, tools, and menus within integrated database to allow users to graphically display subsistence fishery information by community, location, or drainage.
3) Provide access to the Geographic Information System on the World Wide Web.

Methods:

The Southeast Subsistence Fisheries Geographic Information System Database, developed by the investigator and his agency during studies FIS 00-039 and 01-103, would serve as a model for this statewide project. The system of organization of numerical harvest data and analytical approaches established for the Southeast project would be adopted for the statewide information. Spatial relationships between fishing communities and streams have previously been developed

in various community use area research and Southeast Alaska harbor seal harvest research projects.

To keep pace with the changing Geographic Information System technology, the Division of Subsistence would upgrade its ArcView version 3.2 software to the newly released version 8.1. Customization of this software would be accomplished using Visual Basic programming language to design query boxes, pull-down menus, summary maps and chart options. Special buttons, toolbars, and menus would be programmed to perform specific tasks for working with Alaska Subsistence Fishery Database information. To accomplish this in the most efficient and effective manner, the investigator would attend a training class in Visual Basic.

Existing Alaska Department of Fish and Game electronic map coverage would be used as base maps for the Geographic Information System. Features on the maps would be linked to data records from the Alaska Subsistence Fishery Database by converting subsistence fishery data from a Microsoft Access format to Dbase and then transferring these data into ArcView. This linking, or geo-referencing, of graphically depicted landscape features to data records was anticipated during development of the Alaska Subsistence Fishery Database through the use of the same stream reference codes contained in the anadromous fish stream Geographic Information System data catalogue maintained by Habitat and Restoration Division, Alaska Department of Fish and Game. Information related to a specific community would be linked to the map using the community name as the geo-referencing variable.

In addition to the data contained in the Alaska Subsistence Fishery Database, the Geographic Information System would contain other geographic data relevant to subsistence fisheries. For example, locations of regulatory markers defining different subsistence fisheries, showing the boundaries in and around the water bodies where fishing is permitted, would be available in the program.

The Geographic Information System would be designed and made available for public use as both a self-contained, portable system on CD-ROM, to be run using either ArcView GIS software or the free Arc Explorer program, and as an Internet application. Users would be able to select harvest information of interest by using search criteria such as year, community, fish species, and water body. Results of database selections would be displayed in the form of graphs and charts within the project. Queries based on data parameters such as communities with greatest harvests, communities with a certain level of participation, or streams with a certain number of fish harvested, would also be possible. Communities and water bodies that fit the criteria used would also be illustrated on a map. The uniform data structure of the Geographic Information System and database projects would ensure that functionality of the system would be maintained with addition of each year's harvest information.

Deliverables/Products:

The Alaska Department of Fish and Game, Division of Subsistence will produce a CD-ROM of the completed project, containing a number of scalable maps with geographic features linked to the subsistence fisheries harvest information found in the Alaska Subsistence Fishery

Database. The CD-ROM will be delivered to, and demonstrated for the Office of Subsistence Management, Fisheries Information Services Division, and training in the use of the GIS will be made available. CD-ROMs would also be made available to other appropriate federal and state agencies, Regional Subsistence Councils, as well as local communities and other interested parties. As needed, local communities and Regional Advisory Councils would receive a demonstration of the project. The Internet-based application will also be demonstrated and made available to the public.

Experience of Investigator(s):

The Alaska Department of Fish and Game, Division of Subsistence, has generated, collected, and stored geographic information related to subsistence fisheries harvests for 20 years. The principal investigator has worked with Division of Subsistence spatial data for over two years. Projects he has worked on and supervised include a Southeast Alaska harbor seal harvest location atlas, ten different community harvest use area mapping projects, and a Southeast Alaska Subsistence Fisheries Geographical Information System Database (FIS 00-039 and FIS 01-103), which would served as a model for this proposed statewide project.

Partnerships/Collaboration/Consultations:

As has been done for the Southeast project, the Alaska Subsistence Fisheries Geographic Information System project would be available for review and use by Regional Subsistence Councils, local governments, environmental programs, and resource managers. The project would have a statewide perspective to provide access to data contained in the Alaska Subsistence Fisheries database. Individual communities or agencies could use the database as a tool in their own research, with maps and charts available for illustration and organizational purposes. For example, Division of Subsistence meetings with the Organized Village of Kake in the summer of 2000, to demonstrate and discuss the Southeast Subsistence Fisheries Geographic Information System project, led the Village to use the Geographic Information System as a model for their own traditional use area mapping and documentation projects. Other groups may choose to modify the Geographic Information System for their own particular needs as well.

Justification:

This project would provide a graphic means for selecting, analyzing, and displaying subsistence fishery information. Development and distribution of this Geographic Information System database is intended to facilitate research and fisheries management by local organizations and individuals as well as agencies. Some Regional Advisory Councils have expressed concern about the value of statewide proposals, since they feel relationships to regional priorities, regional partnerships, and regional benefits are often unclear. Benefits of this project include making in- and postseason data more easily and widely accessible via the Internet or self-contained CD-ROM systems. This information would be available as a statewide database, using a Southeast project conducted by the investigator as a prototype. Products from this work would

be immediately useful for fishery managers, and would serve to build capacity for regional and local organizations by providing assess to important information. Project objectives are clear and achievable, methods are technically sound, and identified products would be of wide general use. The investigator and his agency have the technical and administrative expertise to complete this project, as demonstrated by their established track record with similar projects. Consultations are ongoing at the regional level. While there are no local partners to assist in conducting the work, results of the project would be readily available to agencies and communities in a familiar format. Several local residents, communities, and organizations have expressed concern with making some types of subsistence information widely available through publicly accessible databases, particularly on the Internet. The Office of Subsistence Management will be working with both the Solicitors Office and Contracts and Government Services Division to identify appropriate information sharing standards that can be established under existing laws and regulations. This issue is also being addressed the Statewide Database Working Group funded under study FIS 01-054.

Not Recommended For Funding

02-047

Alaska Subsistence Salmon Harvest Timing (Phase 1): Bristol Bay, Chignik District, Cook Inlet, and Kuskokwim Drainage

Investigator(s): Division of Subsistence, Alaska Department of Fish and Game

FY2002 Budget: $ 13,991.29

Total Budget (2 years): $ 28,488.00

Geographic Area: Inter-Regional

Information Type: HM/TEK

Issues:

There is a lack of ready access to information on subsistence salmon harvests timing by community and harvest location. Such information is often needed to assess inseason harvest results, to evaluate impacts of regulatory changes on subsistence salmon harvest, and to select research sites for specific species and stocks. This project would also help to improve the practice of recording harvest dates on subsistence permits and calendars by demonstrating how harvest timing information can benefit subsistence users.

Objectives:

1) Provide a database of subsistence salmon harvests by date, species, and location for subsistence fisheries in Bristol Bay, Chignik District, Cook Inlet, and the Kuskokwim Drainage.

2) Graphically depict subsistence fishery harvest timing through charts showing percentage and estimated numbers of annual daily and cumulative harvest for selected time periods.

3) Provide a standard framework, based upon the Alaska Subsistence Fisheries Database, which can be easily updated and expanded to accommodate harvest-timing data from all subsistence fisheries.

4) Promote daily reporting of subsistence harvests on permits and calendars by demonstrating the utility of harvest timing information in fisheries management.

Methods:

This project would provide harvest timing information from subsistence salmon fisheries harvest assessment programs administered by the Division of Subsistence, Alaska Department of Fish and Game, in Bristol Bay, Chignik District, Cook Inlet, and the Kuskokwim Drainage. It would serve as a model for providing this information on a statewide basis. In certain situations, when salmon run timing information is not available, harvest timing can be used to estimate run timing. However, harvest timing can often differ from salmon run timing due to local conditions and management regulations that can influence harvest and preparation activities disproportionately to resource availability.

The source of harvest timing information used for this study would be reported harvests by date between mid-May to mid-October, which would accommodate the general period of salmon runs. The harvesting of spawned out salmon ("redfish") is poorly represented by dates of harvest, since this activity frequently occurs after permit reporting period or village surveys end. Thus, estimates of numbers of species harvested would exclude late season harvests of redfish, which is a common occurrence in certain fisheries within Bristol Bay and the Chignik areas. Harvests without specific dates would be excluded from analyses. Timing of harvests of individual species by location and user residence would be extracted from permits and calendars for each subsistence fishery. Efforts would be made to identify community, location, and year combinations for which harvest information is poorly documented. Timing data would be placed within a database modeled after, and using conventions developed for the Alaska Subsistence Fisheries Database and established by the Subsistence Fisheries Harvest Assessment Working Group in 2001 during study FIS 00-017. The resulting database would be constructed so that it could be queried for fishery, species, and location to produce tables and charts of harvest timing for specified years or multiyear averages representing either percentages or estimates of harvest numbers. Use of this database would replace the existing approach of creating tables and charts within Excel. Not only the existing method tedious, since it requires previous summarizing of data, but it also entails reiteration of all steps for each update of a year and location. This has resulted in limited usage of this information, use of out-of-date information, and a greater potential for the introduction of errors.

The summarized harvest timing information from the database would be readily available in seven formats: 1) tables showing daily percentage and cumulative percentage harvests by date; 2) tables showing estimated numbers of daily harvest and cumulative harvest by date (exclusive of "post-season" harvests); 3) charts of cumulative percentages; 4) charts of estimated cumulative inseason harvests; 5) charts of daily percentages; 6) charts of estimated daily inseason harvests; and 7) data to export into Excel spreadsheets for further analysis.

The database would be demonstrated in Anchorage for interested agencies and organizations, as well as during regional harvest monitoring workshops organized under study FIS-01-107. Initially, the harvest-timing database would be distributed on CD-ROM as separate Access 2000 entities to make it compatible with the limited computer resources that exist in many rural communities. Future integration of the harvest-timing database with the existing Alaska Subsistence Fishery Database would be explored for usefulness and utility.

Deliverables/Products:

The investigators would provide a CD-ROM containing both the Alaska Subsistence Fisheries Database and the Alaska Subsistence Harvest Timing Database in Microsoft Access 2000 to the Office of Subsistence Management and other interested agencies and organizations. An intuitive menu system would allow immediate access to tables and figures by selecting the fishery, location, and time period of interest.

Experience of Investigator(s):

The Division of Subsistence, Alaska Department of Fish and Game currently administers subsistence fisheries harvest reporting for the Bristol Bay area, Chignik area, Cook Inlet area, and the Kuskokwim Drainage; and has been responsible for the creation and maintenance of several databases that facilitate understanding and managing subsistence resources. Microsoft Access databases developed include the Alaska Subsistence Fisheries Database and the Community Profile Database.

Partnerships/Collaboration/Consultations:

All proposed work would be done using information collected as part of existing harvest assessment and permit systems, which have existing partnerships with various rural communities and organizations. The model developed would allow opportunities for collaboration with organizations with limited database experience that wished to add fisheries (both salmon and non-salmon species) to the database.

Justification:

This statewide project would provide harvest timing information for subsistence fisheries managed by Alaska Department of Fish and Game, and could be used as a model to develop similar capabilities for other subsistence fisheries within the state. A summary of ten years of existing data would be included in a Microsoft Access database, which would be distributed on CD-ROMs. The data would be readily available to all users, and in this sense builds capacity for partners. Bristol Bay, Chignik, Cook Inlet, and Kuskokwim Drainages all have rivers and streams under federal fishery management jurisdiction. While this proposal does not directly address an issue identified and prioritized by the Regional Advisory Councils, the project would facilitate state and federal management of salmon, including some populations of concern. By providing easy access to harvest timing curves, this type of information would be more readily used in making management decisions. Study objectives are clear and achievable. The study is appropriately designed, and the methods are technically sound. The products identified are acceptable, and would be of use to federal managers within a regional context. The investigator and agency both have technical and administrative expertise to conduct this work, as well as an excellent track record with past projects and cooperative ventures. The project would use existing subsistence data, so no additional field collections would be required. Consultations are ongoing at the regional level, and results would provide more ready access to the data for rural residents. The project would not employ or train any local residents, or be conducted in

partnership with any local organizations. Several local residents, communities, and organizations have expressed concern with making some types of subsistence information widely available through publicly accessible databases, particularly on the Internet. The Office of Subsistence Management will be working with both the Solicitors Office and Contracts and Government Services Division to identify appropriate information sharing standards that can be established under existing laws and regulations. This issue is also being addressed the Statewide Database Working Group funded under study FIS 01-054.